

**THE  
UPDATED  
PLAIN ENGLISH GUIDE  
TO  
ALASKA  
DRINKING WATER AND WASTEWATER  
REGULATIONS**



For Rural Utilities  
Serving 25 to 1,500 People

State of Alaska  
Department of Community and Economic Development  
Department of Environmental Conservation



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**Department of Community and Economic Development**

A copy of this guide can be downloaded  
from the department's website at:  
[www.dced.state.ak.us](http://www.dced.state.ak.us)

Published by

**Alaska Department of Community  
and Economic Development  
Division of Community and Business Development  
Rural Utility Business Advisor Program**

With funding from

**U.S. Environmental Protection Agency**

Editorial Review by

**Alaska Department of Community  
and Economic Development  
Alaska Department of Environmental Conservation  
Alaska Native Tribal Health Consortium**

Updated by

**HDR Alaska Inc.**  
2525 C Street  
Anchorage, Alaska 99503

June 2002

**DCED Project Manager  
Peter McKay, Juneau**

***Cover Photo:***

A Fairbanks water delivery service in 1927  
(Anchorage Museum of History and Art BL 85.63.287)

# Contents

<b>7</b>	<b>Introduction</b>
7	The Week Everything Went Wrong
8	The Purpose of This Guide
11	The Importance of Good Water and Sanitation
<b>15</b>	<b>Chapter One</b>
	<b>Dealing with the Regulations</b>
15	Multiple Moving Targets
16	The Twelve Biggest Issues for Rural Water and Wastewater Utilities
22	Testing and Reporting Road Map
<b>25</b>	<b>Chapter Two</b>
	<b>Community Capacity</b>
26	Capacity Self-Assessments
28	Ways to Build Capacity
<b>31</b>	<b>Chapter Three</b>
	<b>Building or Updating</b>
	<b>a Drinking Water Plant</b>
32	Plan Approvals
36	Certificate to Construct
37	Interim Approval to Operate
38	Final Certificate to Operate
<b>39</b>	<b>Chapter Four</b>
	<b>Operator Certification and Training</b>
39	Certified and Qualified Operators
41	Training

## Contents

<b>47</b>	<b>Chapter Five</b>
	<b>Basics of Water Source Protection and Testing</b>
47	Water Sources
50	Wellhead and Watershed Protection
50	The Sanitary Survey
51	Treated Water Testing
<b>55</b>	<b>Chapter Six</b>
	<b>Operations Testing</b>
55	Daily Onsite Tests
55	Monthly Coliform Test
56	Monthly Reports
56	Safe Limits
58	More on the Four Tests
<b>65</b>	<b>Chapter Seven</b>
	<b>Compliance Testing</b>
65	Choosing Labs
66	Taking the Samples
69	Maintaining the Chain of Custody
71	Comparing Results to Safe Limits
72	Exceptions to the Requirement
77	Overview of Drinking Water Tests
<b>79</b>	<b>Chapter Eight</b>
	<b>Details on the Tests</b>
79	Surface Water Treatment Rule (SWTR)
83	Disinfectants and Disinfections By-Products Rule (D/DBPR)
85	Total Coliform Rule (TCR)
90	Fluoride (F)
92	Nitrate and Nitrite ( $\text{NO}_3/\text{NO}_2$ )
94	Lead and Copper (Pb/Cu)
97	Inorganic Chemicals (IOCs)
99	Arsenic (As)
101	Volatile Organic Chemicals (VOCs)
105	Synthetic Organic Chemicals (SOCs)
108	Asbestos
110	Radioactive Materials

<b>115</b>	<b>Chapter Nine</b>
	<b>Consumer Confidence Reports</b>
115	CCR Delivery
116	CCR Requirements
119	Helpful Hints
<b>121</b>	<b>Chapter Ten</b>
	<b>Posting a Public Notice</b>
<b>129</b>	<b>Chapter Eleven</b>
	<b>Running a Wastewater Disposal Program</b>
130	To Whom Does This Chapter Apply?
130	Setting Up a Wastewater System
135	Common Wastewater Systems in Alaska
137	Operating a Wastewater System
139	Separation Distances
139	Water Quality Standards
<b>143</b>	<b>Acronyms and Abbreviations</b>
<b>145</b>	<b>Glossary of Terms</b>
<b>155</b>	<b>Appendix A: Who to Call for Help</b>
<b>157</b>	<b>Appendix B: Information Sources</b>
<b>163</b>	<b>Appendix C: Sample Siting Plan</b>
<b>165</b>	<b>Appendix D: Certified Testing Labs in Alaska</b>
165	Microbiology Labs
168	Certified Drinking Water Labs in Alaska
<b>169</b>	<b>Appendix E: Regulations Used in Guide</b>
<b>171</b>	<b>Appendix F: Compliance Calendars</b>
<b>175</b>	<b>Index</b>





# Introduction

## The Week Everything Went Wrong

*“My village learned a couple of years ago how valuable a water operator can be. This could happen to you. One week I had to fly into Fairbanks on business. It was the middle of winter, and while I was crossing the street, I slipped and cracked my knee on the curb and spent two days in the hospital. Then my flight home was cancelled once due to mechanical problems, and a second time due to ice fog. By the time I got home, ten days had gone by.*

*“I didn’t know how bad things were until I was met at the landing strip by two school teachers, the head of the village corporation, and the health aide, among others. It seems the second day I was out of town the power had failed, and when it came back on, the water utility did not restart properly. The backup operators were both fairly new on the job, and when they finally got the pumps started and were refilling the tanks, raw river water was going right into the distribution system without having the required contact time with the chlorine. (It turned out that the plant had been plumbed wrong all these years, and it should not have been possible for this to happen.) But since there was no testing being done, no one knew that harmful bacteria were going right to people’s bathrooms and kitchens. They only found out when people all over town began getting seriously ill with stomach cramps, diarrhea, and headaches. Village life pretty much came to a standstill for several days.*

*“Well, then the temporary operators figured they needed more chlorine in the water. Trouble is, they didn’t know the exact way to do it or test whether it was done right, so they just guessed.*

## Introduction

*“At first they superchlorinated the water, which gave it such a strong taste it was undrinkable. So they backed the chlorine content down until it could not be tasted but by then no one trusted it and everyone went to boiling their own water, a real pain. When I stepped off that plane, I was met with a very unruly crowd who really didn’t care that I was in a cast or that I hadn’t seen my wife in almost two weeks. It was straight to the water utility to set things right.*

*“Two days later things were back to normal, and I was a very popular guy. I later learned just how popular I was. To this day there is a note on the bulletin board at the landing strip that reads: ‘**Unless Joe has taught at least two people how to run the water utility, he’s not allowed on any outgoing plane!**’”*

\* \* \*

This story is based on a true occurrence from an Alaskan village. Too often people in Bush Alaska get sick because of a lack of safe water for drinking and washing or from unsafe handling of wastes. This guide is one of several efforts to upgrade sanitary conditions in rural Alaska.

## The Purpose of This Guide

The Updated Plain English Guide to Alaska Drinking Water and Wastewater Regulations targets operators and managers of rural Alaska public water and wastewater utilities serving up to 1500 people. The guide was written to help you understand and comply with state and federal regulations. (Appendix E lists which regulations were used in writing the guide.)

Why read it? If you already know how to run a water and wastewater utility this book can still be useful to you. Quite a few people who run water utilities are not doing it full time, so they don’t have the time to interpret the regulations

## Introduction

or learn all the ins and outs of every process. The sheer size and complexity of the regulations make them a real challenge for *anybody* to understand. This guide covers the most important points.

Operators and managers may know *how* to do a certain water test, for instance, but aren't sure *why*. This guide touches on both the *how* and the *why*.

This guide is review material for experienced operators and a good introduction for new ones; it is not a step-by-step training manual in all phases of operations. This guide talks about regulations pertinent to small rural water and wastewater utilities; it is not a restatement of all the hundreds of pages of regulations. Its goal is to help small utilities avoid the most common health dangers and rule violations.

What this guide is and what it isn't

Note: If you are dealing with a septic system for a **single family home, duplex**, or a **private well**, much of this guide will not apply. However, Alaska Department of Environmental Conservation Drinking Water and Wastewater Programs have information and can provide help for these systems. Contact the nearest office. (Appendix A has the numbers of the ADEC offices.)

While it may be helpful to read the guide from cover to cover, here are some ways to find what you need more quickly.

How to use this guide

- Scan the table of contents. All sections are simply named.
- Use the index for a more specific search.
- Refer to the glossary or list of acronyms if you run across an unfamiliar term.

## Introduction

- Much information is contained in tables and charts. Use them, copy them, enlarge them, laminate them, put them up on the wall.
- Feel free to get ahead by turning to the end-of-chapter summaries for a list of key points.
- Some sections do not apply to all water systems. Icons mark information pertinent to the following systems:



groundwater sources



surface water sources



systems that chlorinate



systems that fluoridate



wastewater treatment

- The information on testing has been broken into three chapters. The first, *Operations Tests*, covers the most critical tests—daily onsite tests for the most part. The next, *Compliance Tests*, deals with samples sent to certified labs for testing. Finally, all the tests are then spelled out in more detail in the *Details on the Tests* chapter.
- The Appendices are quick reference sections for agency contacts, training, and educational resources (including internet sites, sample siting plan, list of certified labs, list of regulations used in this guide, and compliance calendars which list important requirements and when they need to be done.)

**Remember:** Check the regulation dates in Appendix E against the current regulation dates to see what has changed since this guide was published. Also check with DCED about updates to this guide.

## Introduction

If you have any questions or comments about this guide, or suggestions for future editions, please contact the Department of Community and Economic Development (DCED) at the address or phone number in Appendix B.

## The Importance of Good Water and Sanitation

Safe drinking water is crucial to quality life in rural Alaska. Every village depends on water for drinking, showers, cooking, washing clothes, and other important uses. If there is no safe water, how can anyone safely prepare food, maintain cleanliness, or provide health care?

If there is no sanitary disposal of wastewater, living conditions in the village can deteriorate. Who wants to worry about who will get sick next?

Bad drinking water can spread disease. And if your village wastewater system is not developed and maintained properly, you could be leaving the door open for a health disaster. Painful cramps, gas, headaches, fever, vomiting, and diarrhea can all result from getting harmful bacteria, viruses, and protozoa in your body. Through the years Alaskan villages have been hit by hepatitis. The potentially deadly *E. coli* bacterial infection has also been a problem in some

Water and  
waste-borne  
diseases

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“I am the most important person in my village. I may not be a whaling captain or the Mayor, but I’m the one who makes sure that everyone stays healthy. The only problem is that no one knows when I’m doing my job. But I kind of like it that way. If no one’s getting sick from the water, I’m doing what I’m supposed to be doing.”

## Introduction

communities. Most of these sicknesses can be easily prevented by sanitary waste disposal practices or if they are in the water, with proper treatment. Also, simple hand washing can help prevent the spread of disease.

“Bad water  
affects children  
and elders first”

The parasitic protozoa that cause the serious “beaver fever” (Giardiasis) can be introduced to your watershed by an animal from miles away. Another dangerous protozoa, *Cryptosporidium*, must be filtered out, since chlorine does not work well against it. The chemical contaminant nitrate can kill babies under six months old by robbing the oxygen right out of their bloodstream (“blue baby” syndrome or methemoglobinemia). Nitrate from sewage can leach through the ground and into the water. If you test for it regularly, you will be aware if nitrate is a problem. Lead might also be a danger to your community. Lead in your water can damage brain cells, especially in children. Organic chemicals, like solvents and gasoline, that leak into your water supply can be a serious health hazard and cause cancer.

The key  
to prevention

Don’t be overwhelmed; all these problems can be controlled. If you set up a good system, outline operating procedures, and follow them, water and waste-borne disease will be virtually unknown in your community. The key to this is consistently treating and monitoring the water and being careful about waste handling. Consider the regulations as the *minimum* level of protection. Consider your job as the front line in the quest for a healthy community.

## Notes

[illegible]

## Notes

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



## Chapter One

# Dealing with the Regulations

### Multiple Moving Targets

Each utility has to comply with two or three sets of regulations. The first set of regulations to consider is federal. After these are the state regulations, and if you live within the boundaries of a borough or city, there may be local regulations as well. You must comply with all regulations. These are written for the safety of your village and the protection of the land and water. It is also important to remember that rules, regulations, and laws change frequently. Stay in touch with ADEC to make certain you know the most current requirements. The effective dates of the regulations covered in this guide are listed in Appendix E.

Because there are so many regulations, it is often hard to keep them straight. And sometimes, because technical and legal experts write the regulations, they can be difficult to understand for many of us. If you have any questions, you should call your nearest government or sanitation advisor. (See Appendix A for contact numbers.)

Help is available

The people most likely to have frequent contact with you are the Alaska Department of Environmental Conservation (ADEC) Drinking Water or Wastewater Program staff members, a health corporation's Remote Maintenance Worker (RMW), or a DCED Rural Utilities Business Advisor (RUBA) staff. You may contact the technical staff at the ADEC Drinking Water Program for specific guidance on regulations, testing,

## Chapter One

and plan approvals. They are the authority for implementing and making decisions. See the listing of ADEC field contacts and the “who to call” diagram in Appendix A.

Staying in touch with ADEC is critical because the best way to solve problems is to stop them before they start. ADEC and the Alaska Native Tribal Health Consortium (ANTHC) can also be helpful in finding funding for your utility.

## The Twelve Biggest Issues for Rural Water and Wastewater Utilities

The following drinking water and wastewater issues are the most common violations for systems of your size in Alaska. Remember, if you avoid these violations, you will also avoid unnecessary safety risks. The main things to remember are:

- Protect water sources from contamination
- Properly treat water to make it safe
- Test water to confirm safety
- Report the results to ADEC and your customers
- Keep up to date on regulations

*Now, the Top Twelve...*

1. Determining and building capacity  
Capacity refers to a community or utility’s ability to operate and maintain a water or wastewater utility. Capacity is not only operating a system but managing and financing it, too. Utilities must have systems with trained staff and a proper organization in place in order to provide safe drinking water.

*See Chapter 2*

## Dealing with the Regulations

If samples are not collected every month, you won't really know how well your treatment system is working or the condition of your water source. People can (and do) get seriously sick if bacteria, viruses, or protozoa get through the treatment system. This important test tells you if these microbes are in your water.

*See Chapters 6 & 7*

If your water source is surface water, it is probably contaminated by bacteria, viruses, and protozoa. Your filtration and disinfection (chlorine) systems help prevent these microbes from ending up in your finished drinking water. The daily turbidity and residual chlorine tests let you know how well the filter and chlorine treatment are working. If the test results are bad, you can take action right away to fix the problem.

*See Chapter 6*

The state needs to be assured that you are properly treating water to be safe for customers. If your utility uses surface water, turbidity and residual chlorine results must be written on the logsheet every day and a copy of the logsheet must be sent to ADEC every month. This is the monthly report required by ADEC. If you add fluoride to the water, ADEC needs to see the results of those daily tests on your logsheet each month too. ADEC will review the logsheet to make sure you are doing the important tests and that the results show the system is protecting your health.

*See Chapter 6*

New rules will go into effect between 2003 and 2006 for additional treatment of ground water and surface water to protect the public against viruses and *Cryptosporidium*. Also, new testing requirements for

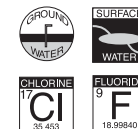
2. Testing  
for coliform  
bacteria



3. Testing  
turbidity  
and residual  
chlorine daily



4. Sending  
monthly reports  
of daily turbidity,  
residual chlorine,  
and fluoride  
test results  
to ADEC



5. Understanding  
new regulations



## Chapter One

“Just as important as testing is the recording of the results. Unless there is a written record of the test data, there is no way to track the unique traits of your utility.”

radon, arsenic, and disinfectants will be required. Sure, this is more cost and more work, but the result is safer drinking water. It is important that you stay on top of new regulations to make sure that you maintain a safe water supply.

If you can provide information to ADEC showing that some of these new chemicals could not possibly be in your water or piping systems, they might give you a waiver from sampling. However, you may find out that ADEC knows of pollution sources or low chemical concentrations that are still dangerous, so you may still have to sample. In that case, you must sample on the schedule set up by ADEC and make sure money is available for the laboratory costs.

Importantly, ADEC can send you a one-page summary of your water sampling requirements. It is called a “monitoring summary” and gives your current status of test reports and future requirements. It’s good for keeping track of the tests that aren’t done very often. The monitoring summary can help you keep track and document what you have done, in case questions come up.

Although the federal government has tried to make the water sampling schedule easier to understand, it is still very complicated. If you have any questions, call the ADEC Drinking Water Program staff for help. A list of people who can help is provided in Appendix A.

*See Chapters 6, 7, & 8*

6. Completing a sanitary survey when it’s due



The sanitary survey helps identify problems with water sources and equipment or systems that may not be working right. New rules are now based on the drinking water source, not class. Utilities providing drinking water from surface water or ground water under the influence of surface water (GWUISW) must complete

## Dealing with the Regulations

a sanitary survey every three years. Utilities providing drinking water from a ground water source must complete a sanitary survey every five years.

*See Chapter 5*

You must write a Consumer Confidence Report (CCR) that includes information about your water source, the levels of any detected contaminants, and compliance with drinking water rules, plus some educational material. The purpose of the CCR is to give community members information about their water system that they can understand, so that they can make informed decisions about their water use.

*See Chapter 9*

Do not begin construction or modification of a water or wastewater system until ADEC Drinking Water or Wastewater Program staff review and issue plan approval or issue a letter confirming that no plan approval is required for the new or changed system.

*See Chapters 3 & 11*

7. Distributing a Consumer Confidence Report (CCR) once a year

8. Getting “plan approval” from ADEC before building or changing a water or wastewater system



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“I’m not too worried about any state or federal people showing up to look over my utility. Realistically, the only time they show up is when the situation is so bad that I really NEED their help. But I do worry about the children and elders in the village. Everyone else is healthy enough that a day or two of bad water might give them only an upset stomach. But children and older folks are a lot more sensitive to bad water. I don’t want my children—or anyone’s children—sick, so I take extra care to make sure the water is treated and safe to drink.”

## Chapter One

9. Preparing a written sample siting plan for coliform testing



Water systems are required to have a written plan that explains where, when, and how coliform samples will be collected. This plan is called a sample siting plan. The plan makes sure you are collecting from the correct faucets, makes sure you know how to collect the sample without contaminating it, and makes sure you know what to do if a sample comes back positive (coliform bacteria present).

The plan *must* be available onsite and updated if anything changes (for example, if a sample location is no longer available or there is a change in disinfectant).

*See Chapter 8 & Appendix C*

10. Taking extra samples if coliform is detected



An initial positive sample for coliform must be followed up right away with one or more samples to verify the problem. These extra samples are called “repeat samples” and too often are not collected on time. They have to be collected and sent into the lab within 24 hours of finding out about the coliform in the water. Time delay can be a problem in remote locations.

*See Chapters 6 & 7*

11. Posting a public notice to warn people of bad water



Once you know for sure that your water is unhealthy, you need to get the word out to everyone who drinks the water. They need to know as soon as you find out. Post a public notice in a few popular gathering places. Talk to everyone and tell them to pass the word around. Have it broadcast on the CB radio and call the commercial radio station in your region and ask them to read the notice on the air. Call ADEC. Read the Public Notice section of this guide. **BEST OF ALL, BE PREPARED:** Review the requirements for a public notice *before* something happens.

*See Chapter 10*

## Dealing with the Regulations

If wastewater is not treated properly, it could mix into the environment and pollute your drinking water source. Nitrate and fecal coliform contamination are the most serious problems, but chemicals and viruses also cause concern. If anyone eats, breathes, or accidentally exposes a cut or wound to even a small amount of fecal contamination, they could get diarrhea, stomach cramps, headaches, nausea or even worse, hepatitis. It is very important that wastewater disposal systems work properly to avoid unhealthy conditions.

*See Chapter 11*

The road map on the following page tells you what tests are needed for your system type and where in this guide you can find more information. A more detailed look at the requirements is presented in a series of “compliance calendars” at the very end of this guide. Supplement these calendars and road map with other material in this guide, as well as material from ADEC (especially the custom “monitoring summary” they provide), EPA, and other sources. See Appendix B for more ideas.

12. Maintaining the wastewater system.



“Hepatitis A is only transmitted through fecal to oral contact.

In other words, don’t get poop on your hands and then get it into your mouth.

You could do this unknowingly if you don’t wash your hands after going to the bathroom.”

- ✓ **There are federal, state, and sometimes local regulations to follow. They are written for the safety of your village and the protection of the land and water.**
- ✓ **The rules, regulations, and laws change. Stay in touch with ADEC to stay current.**
- ✓ **Focus on the most important safety issues first, striving for a consistent operation. Review the top twelve issues in this chapter for ideas of what is important.**

Summary

## Testing and Reporting Road Map

Requirement	See chapter	Groundwater		Surface water (or GWUDISW)	
Tests		Class A	Class B	Class A	Class B
Total Coliform[]	7 & 9	✓	✓	✓	✓
Turbidity[]	7 & 9			✓	✓
Residual Chlorine (if used)[]	7 & 9	✓	✓	✓	✓
Surface Water Treatment Rule[]	9			✓	✓
Total Coliform Rule[]	9	✓	✓	✓	✓
Fluoride (if used)[]	7 & 9	✓	✓	✓	✓
Nitrate[]	7 & 9	✓	✓	✓	✓
Nitrite[]	7 & 9	✓	✓	✓	✓
Inorganics (IOCs) (unless waived)[]	7 & 9	✓		✓	
Volatile Organics (VOCs)[]	7 & 9	✓	✓	✓	
Radioactivity[]	7 & 9	✓		✓	
Lead/Copper[]	7 & 9	✓	✓	✓	
Asbestos (unless waived)[]	7 & 9	✓	✓	✓	
Synthetic Organics (SOCs) (unless waived)[]	7 & 9	✓		✓	
Disinfectant by-products (D/DBP)[]	7 & 9	✓	✓	✓	✓
Arsenic[]	7 & 9	✓	✓	✓	✓
<b>Routine reports &amp; other documents</b>					
Monthly report to ADEC[]	6			✓	✓
Annual Consumer Confidence Report[]	10	✓		✓	
Sanitary Survey[]	6	every 5 yrs	every 5 yrs	every 3 yrs	every 3 yrs
Sample Siting Plan (coliform)[]	9 & App. C	✓	✓	✓	✓
Operator Certification[]	5	✓	✓	✓	✓
Plan Approvals[]	4 & 12	✓	✓	✓	✓
<b>Special circumstance or response document</b>					
Public Notice[]	11	✓	✓	✓	✓

GWUDISW = groundwater under the direct influence of surface water.

Class A = serves 25 or more people for at least 6 months per year or 15 or more connections all year.

Class B = serves 25 or more people for at least 60 days per year.



## Notes

[illegible]

## Notes

[illegible]

## Chapter Two

# Community Capacity

*Capacity* refers to a community or utility's ability to operate and maintain a water and wastewater system. Capacity doesn't mean just having safe drinking water available for everyone; capacity is having the technical abilities, managerial skills, and financial resources to meet state and federal regulations.

Although every place is different, all utilities are required to have trained staff and an organization in place for providing safe drinking water. Having capacity includes everything from having at least one operator in the village at all times, to making sure the books are in order and the bills are getting paid, to having the money to replace parts. Thus, every board member, council member, manager, office assistant, and operator needs to know certain aspects of their water system and how their role affects its operations.

"Capacity development" was officially recognized and emphasized in the 1996 amendments to the Clean Water Act. ADEC made rules to deal with these new regulations. In fact, currently ADEC cannot give approval to construct a new public water system unless the utility can show it has the managerial, financial, and technical capacity to operate its system before it is built. To help communities and utilities comply with these regulations, ADEC worked with a citizens' advisory board to develop ways to determine capacity.

*Technical capacity* is the ability of local staff to operate and maintain the built part of the water system, including

Definitions

## Chapter Two

the wells, source water intakes, and treatment, storage, and distribution systems.

*Managerial capacity* is the community's ability to administer the water system, including a business structure and communication skills for good staff management.

*Financial capacity* is having an accounting and reporting system that keeps track of the money coming in and going out of the water utility. It means always having enough money to operate the system.

## Capacity Self-Assessments

Below are a few checkpoints to help focus improvements to your water system's capacity. Some of the checkpoints are actually required by ADEC. Other checkpoints are listed to get you thinking about your system's ability to provide safe water into the future. Can your utility put a check mark next to all of them? If not, you may need to look further at your capacity to operate and maintain the water system. To see your water system's capacity in detail, visit [www.nrwa.org/alaskaruralwater/](http://www.nrwa.org/alaskaruralwater/) and talk with ADEC or RUBA staff about a capacity assessment.

- |                    |  |
|--------------------|--|
| Technical capacity | <input type="checkbox"/> As required, your water system completes water quality testing on time, and the water meets regulatory standards.   |
|                    | <input type="checkbox"/> Your water system submits required operator reports on time.  |
|                    | <input type="checkbox"/> The operation and maintenance plan is a part of the daily checklist for the water system. Enough supplies, tools, and spare parts are available to operate important system components. |

### Community Capacity

- ☐ The operator is certified at the level required for your type of the water system, and there are enough operators to keep the system running at all times.
- ☐ There is a very clear record showing the staff structure and who is responsible for each part of the operation and management of your water system and when tasks should be completed. Managerial capacity
- ☐ Your system was installed after getting written approval of construction drawings and specifications, and ADEC issued the final operation approval.
- ☐ By-laws, ordinances, tariffs, or rate schedules exist, are used, and are regularly reviewed.
- ☐ There are written job descriptions for each staff member, and the job descriptions are followed. Written policies covering personnel, customer service, and safety exist and are actively used. (Although this documentation is not required by ADEC, it helps everyone understand his or her responsibilities and helps to keep your water system running smoothly.)
- ☐ Your system is current on all bills and financial obligations. In case of emergency, your system has credit or other resources. Financial capacity
- ☐ Your system's rates are set and adopted in writing by the council or board.
- ☐ No more than 20 percent of accounts payable or receivable of any type are more than three (3) months behind.
- ☐ Regular periodic budget reports/balance sheets are produced and reported to the council or board.
- ☐ An annual budget is completed, approved, and filed as required by the water system ordinances. The budget meets operation and maintenance needs.

## Chapter Two

### Ways to Build Capacity

As you understand your utility's strengths and its weaknesses, it is time to start looking at ways to improve your capacity. There are a number of ways to increase your utility's ability to operate and manage the functions required to successfully run your water system. One key way to do this is by training staff. Below are training programs that can help develop capacity to help you run your water system.

DCED has six courses, each a week long, to help your utility build management and financial capacity. These courses include:

- *Introduction to Utility Management:  
Overview and Elements of Utility Management*
- *Utility Planning:  
Steps for Developing a Master Plan*
- *Organizational Management:  
How to Get the Most Out of Your Utility*
- *Personnel Management:  
How to Effectively Work with Your Staff*
- *Operational Management:  
Skills Necessary to Run a Utility*
- *Financial Management:  
How to Manage Your Utility's Cash Flow*

There are many other options for other training in general administrative, computer, bookkeeping, and management skills. A good local source is the University of Alaska and its community college campuses. The University also offers many courses through its distance delivery program. There are private colleges and business that also provide short courses and multi month/year programs.

The Regional Health Corporations and the Alaska Native Tribal Health Consortium (ANTHC) also deliver

### **Community Capacity**

ADEC's Operator Training and Certification Program. Check with your Regional Health Corporation or ADEC for the training nearest you.

- ✓ **Capacity is the ability to properly operate, manage, and maintain a utility in compliance with regulations.** Summary
- ✓ **Capacity includes having the technical abilities, managerial skills, and financial resources.**
- ✓ **A utility should determine where capacity development is needed to assure safe water and compliance with regulations.**
- ✓ **Training is available to help build local resources.**

## Notes

[illegible]



## Chapter Three

# Building or Updating a Drinking Water Plant

Before you can offer one cup of water to your village, you must have a water system that meets federal and state standards and guidelines. Before you can begin any construction on a water utility—regardless of whether it is a new facility or you are expanding or modifying an existing utility—you must get approval from ADEC. Coordinating with ADEC during the planning, construction, and operating phases of your project will save you many headaches.

*For building  
or updating  
a wastewater  
plant, see  
Chapter 11*

Listed below are the steps in ADEC's approval process for building or updating a drinking water plant. They are also shown in the flow chart later in this chapter.

*A step-by-step  
process*

- Meet with ADEC in a **preapplication conference** and get comments on your plan.
- Submit **plan approval** package and plan review fee.
- Obtain **certificate to construct**.
- Obtain **interim approval to operate**.
- Obtain **final certificate to operate**.

Before you start planning or constructing any new project or modification to your existing plant, call the ADEC Drinking Water Program staff and ask if a plan approval is required. In most cases, ADEC will confirm that a plan approval is required, but in some cases plan approval is not required. If that is the case, protect yourself by sending ADEC a letter explaining the project and asking for *written confirmation* that a plan approval is not required.

## Chapter Three

### Preapplication Conference

Good planning will avoid surprises or delays. Early in the planning process, long before design or construction, arrange a meeting with ADEC Drinking Water Program staff to discuss your project. (Contact names and phone numbers are provided in Appendix A.) This initial meeting, called a *preapplication conference*, is not required but is recommended to:

- Discuss your water problems
- Brainstorm solutions
- Identify ADEC contacts
- Identify *permit* requirements (separate from *plan approval* requirements)
- Review the plan approval process
- Identify plan review fees
- Get a completeness checklist

These conferences (meetings of an hour or so) are especially important if you plan to apply for a waiver for a separation distance or variance from certain requirements. Also, if the system is new or innovative (something ADEC has not reviewed before), it would be good to meet with ADEC before the plans go in officially, so the designers can provide data that proves the system meets state regulations.

### Plan Approvals

ADEC has checklists and required forms for submitting a complete review package. If you have grant money or other financial assistance for your project, the agency providing those funds can provide assistance—but *you* are still responsible for compliance. A plan review fee, based on the number of customers you have and the amount of water you plan to produce or supply, must be

### Building or Updating a Drinking Water Plant

paid to ADEC. The fee amount is usually determined in the preapplication conference. ***Projects that include state monies are not charged a plan review fee.*** With few exceptions, plans for a drinking water plant must be signed and stamped by a registered professional engineer.

If you are planning new construction or expansion of your current facilities, pay special attention to aspects of the design that could cause problems. Find a place for your sewage lagoon or sewage disposal area that avoids problems. Keep it away from planned housing areas, airport facilities, wetlands, and high use areas, such as subsistence areas, picnic areas, boat launches, playgrounds, or ballparks. You must maintain certain distances between your water utility and other utilities and structures. These distances are bare minimums, so give them a little extra room to avoid problems down the road; some facilities might be expanded later or not end up exactly where you thought they were going to be. The preapplication conference is a good time to voice any concerns about separation distances—before ADEC officially examines your plans...and makes you redo them.

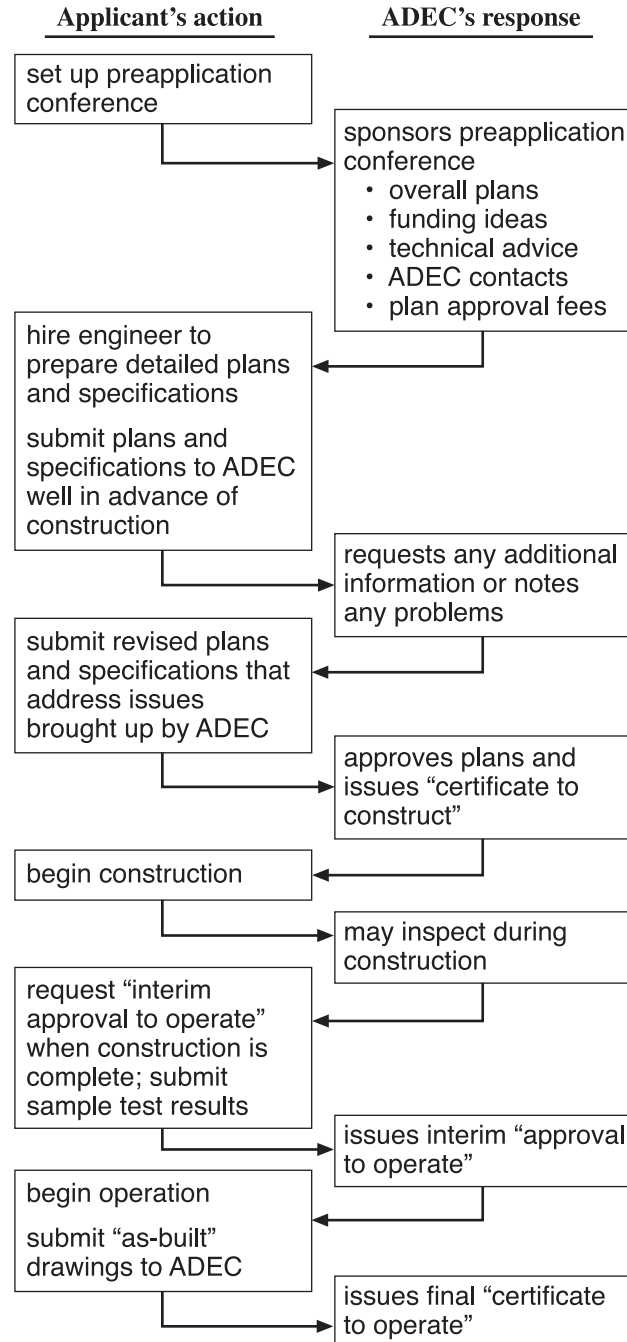
Separation  
distances

### Distance requirements

Class A and Class B drinking water wells must be kept:	
200 ft. from:	Wastewater treatment and disposal systems (tundra ponds, sewage lagoons, honey bucket disposal areas) □□
	Sewage pump stations (lift stations)
	Sewer main cleanouts
	Sewer line manholes
	Privies (outhouses, compost toilets)
	Community sewer lines (utilidors)
	Holding tanks (septic tanks)
	Sanitary landfills (garbage dumps)
	Industrial discharge lines (seafood plants, mines)
100 ft. from:	Private sewer lines
	Petroleum storage tanks (gas, diesel, etc.)

### Chapter Three

The plan approval process



### Building or Updating a Drinking Water Plant

ADEC may approve exceptions (variances) to these separation distances, but the exceptions are not legal until you have reviewed the reasons with ADEC and been issued a written OK.

All construction designs must show that you have made certain that there will be no potential for backflow or cross connections. *Backflow* is the movement of potentially contaminated water into a drinking water system. *Cross connections* are, according to ADEC, any actual or potential mixing between drinking water and a source of contamination. Cross connections could include drinking water mixing with wastewater, drinking water mixing with untreated water (“raw” or “source” water), or drinking water mixing with boiler water.

Prevention  
of backflow  
and cross  
connections

ADEC understands that emergency repairs and routine maintenance to your utility usually do not require submission of plans. But if you are considering any other change, call or submit a description of your planned changes to ADEC. If they say no plan review is required, you may want to get that in writing if there may be a question later. Examples of changes that may require a plan review include:

Changes that  
require plan  
approval

- Changes in system equipment (such as adding water storage tanks)
- Changes in the distribution system (such as adding to the existing utilidor)
- Changes in a chemical treatment process (such as changing from chlorine to ozone disinfection)
- Addition of a new treatment process (such as adding fluoridation)
- Elimination of a chemical process (such as stopping disinfection)

### Chapter Three

If you have any question about whether a change requires plan approval, contact ADEC's Drinking Water Program staff. See Appendix A for phone numbers.

## Certificate to Construct

Once the preapplication conference and plan approval process are complete, you need to request approval to construct from ADEC. If all requirements are met, ADEC will issue a **certificate to construct**. No construction may begin before you have this certificate even if you are in danger of missing the construction season and having to store equipment and supplies over the winter. Advance planning and early coordination with ADEC will avoid these sorts of problems during this phase of your project. During the construction process, if you need to change your design, you must contact ADEC and get approval for the change *before* proceeding.

## Interim Approval to Operate

Once construction is complete, ADEC will issue an **interim approval to operate**. During this interim period, you need to provide as-built drawings and specifications to ADEC and submit treated water test results.

---

“It’s easy for people living in Fairbanks or Anchorage to maintain sanitation. They flush a toilet and never think about where the water is going. They put their trash out on the street, and poof, it disappears. And how often does their water system fail? Out here, we don’t have the money to pay for systems like that. So we have to be extra careful to stay healthy. We make sure our separation distances are maintained and we take our solid waste way away from the village. It’s not easy living in the Bush, but it doesn’t have to be dangerous to our health.”

## Final Certificate to Operate

The final piece of paperwork that shows that a system passes the regulation and guidance requirements is the **certificate to operate**. ADEC issues this after all the final construction and interim operation information has been submitted and approved.

- ✓ **Plan out your steps before beginning anything; don't make any assumptions.** Summary
- ✓ **Have a preapplication conference early on; consider it a free consulting service.**
- ✓ **New construction or significant modification to existing systems requires plans to be approved.**
- ✓ **Plans need two signatures: a registered engineer who drew the plans or can vouch for them and ADEC to approve them.**
- ✓ **Make special note of separation distances; it could save much grief years down the road.**
- ✓ **Watch out for backflow and cross connections.**
- ✓ **You will need three green lights on your way to building or modifying a water system: certificate to construct, interim approval to operate, and final certificate to operate.**

## Notes

This image shows a single page of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



## Chapter Four

# Operator Certification and Training

### Certified and Qualified Operators

Since the health of everyone in the community depends on safe water and sanitation, it is important that utility operators are well trained for their jobs. As of January 2001, *all* Class A drinking water utilities regardless of size are required to employ a certified water system operator. Class B drinking water systems using surface water or groundwater under direct influence of surface water (GWUDISW) must also employ a certified operator.

The State of Alaska has a certification process for utility operators. The certification requirements are different for different sized systems and different water treatments. For example, Class A systems are classified from level I to level IV and are required to have an operator certified at the level of the system. Class B systems are classified as either small-untreated water systems or small-treated systems, depending on whether chemicals are added to the water. Class B systems require that operators are certified to operate that type of system.

There are two certification options for small-untreated public water utilities. A person can take an on-site 25 question multiple-choice exam that is system specific and based on the *Well Owner's Guide* (a study manual created for small untreated systems). To qualify for an on-site exam, you must have at least three months experience operating your water system. Operators that pass the on-site 25-question exam will be certified to act as the supervising operator of **ONLY** the system visited.

Small-untreated  
systems

## Chapter Four

Another option to be certified as a small-untreated system operator is to attend a four-hour training course with a 50 question multiple-choice exam available after the course for *non-site specific* certification. People wishing to obtain non-site specific certification must attend one of the four-hour training courses. Operators passing the 50 question exam will be certified to act as the supervising operator of *any* small-untreated system.

Small-treated systems      New training materials and exams specifically for “small-treated” systems is being developed by ADEC. However, currently there are three options for a person interested in becoming certified to operate a small-treated system.

A person can apply for and take the statewide *Water Treatment Operator-in-Training (WT OIT)* certification exam. Also, a person can attend an “Introduction to Small Water Systems” course and take the WT OIT at the end of the course. If you are interested in either of these options, you should contact ADEC to get application deadlines and test dates for the statewide exam. Finally, the system owner can apply for a “grandparent” certificate for their operator if the person was operating the system on January 18, 2001. However, the grandparented operator has until January 18, 2003, to become certified at the correct level for their system, unless the ADEC determines that the grandparented operator needs to become certified sooner to protect public health and safety.

Large systems      The state certification process for large systems has five levels of expertise, each level authorizing the operator to perform increasingly difficult tasks. The entry level certification is the *Operator-In-Training (OIT)*, which requires 490 hours of operating experience on a particular system or completion of basic training courses approved by ADEC. The next four levels of responsibility and

## Operator Certification and Training

certification are listed in the accompanying table along with their education and experience requirements. Extra education can go toward the experience requirement in many cases. For the higher levels, some experience as the person in charge of a plant is required. This is known as direct responsible charge experience or DRC.

To become certified or gain the next level of certification, you should apply using standard application forms and pay a modest application fee by the application deadline. Take the four-hour test which is offered twice a year in Anchorage, Juneau, Fairbanks, and Prudhoe Bay. If you have a hard time getting to one of those cities, someone may be able to come to you to give you the test. Apply for all tests at least 45 days ahead of time and pay the fee when you arrive at the test.

State certificates are good for three years and expire on December 31st of the third year. To renew a certificate, operators must complete three appropriate continuing education units (CEUs)—the equivalent of about 30 hours of training—and pay a renewal fee. For forms or to schedule a test, write or call the ADEC Facility Construction and Operation Operator Certification. For test dates, get a hold of the calendar mentioned in the Training section below. See Appendix B for address and phone number.

Renewal

For emergencies, there are temporary certificates that allow someone to operate the utility until they can take the exam. These certificates are issued on a case-by-case basis. Certificates from other states may be honored by ADEC on a case-by-case basis.

Special cases

## Training

There are many training resources available for anyone who wants to get certified or increase their knowledge.

## Chapter Four

Under contract to ADEC, the Alaska Training and Technology Center (ATTC) has developed a manual and certification exam for operators of small-untreated public water systems. ATTC also offers a number of courses for operators of small public water systems. The University of Alaska Southeast Environmental Technology Program also offers courses to prepare water and wastewater operators.

In addition, videos, posters, training manuals, pocket guides, and many instate classes are available. These materials are free, inexpensive, or can be borrowed. Contact ADEC Operator Training and Certification Program in Juneau for more information. Also, an internet search will turn up many sources of information from around the country. See Appendix B for a good start.

A calendar of classes, certification tests and deadlines, conferences, etc, is available from the Alaska Training and Technology Center. Call or write ATTC in Sitka or get it off the internet (see the web address given in Appendix B). This handy listing gives locations, dates, and fees for classes on:

- Introduction to Small Water Systems
- Boilers & LMI Pumps
- Electricity
- Wastewater Collection System (both operations and management)
- Surface Water Treatment
- Vacuum Sewer System Training
- Introduction to Cross Connection Control
- Wastewater Biology
- Hazardous Waste Operation and Emergency Response

*and more...*

## Operator Certification and Training

### General operator education and experience requirements\*

	Water treatment	Wastewater treatment	Water distribution	Wastewater collection
<b>Operator in Training (OIT)</b> Education Operator experience	12 years **	12 years **	12 years **	12 years **
<b>Level 1</b> Education Operator experience	12 years 1 year	12 years 1 year	12 years 1 year	12 years 1 year
<b>Level 2</b> Education Operator experience	12 years 3 years	12 years 3 years	12 years 4 years	12 years 4 years
<b>Level 3</b> Education Operator experience Direct responsible charge	14 years 4 years 2 years	14 years 4 years 2 years	12 years 6 years	12 years 6 years
<b>Level 4</b> Education Operator experience Direct responsible charge	16 years 4 years ***	16 years 4 years ***	12 years 8 years ***	12 years 8 years ***

*Note:* Required periods of education, experience, and direct responsible charge (DRC) experience are reflected in years.

\* Additional experience and education criteria and substitution requirements are set out in 18 AAC 74.050 (b) - (g).

\*\* Three months of operation experience or the completion of a department-approved training course, as described in 18 AAC 14.050 (c)(1).

\*\*\* For level III and IV certification that requires DRC experience, a total of four years of operation experience is required, two years of which must also be DRC experience.

“One of the most important things I have done at the water utility actually doesn’t even take place there: I make sure I go to every city council meeting. That way I can hear right away if the village has any health problems. I don’t want to wait a week before the clinic tells me the water is bad. Actually the city council likes it. I’m right there if they have a question. It also helps when budget time comes along because the council knows just how important the water utility is. I don’t have to fight for every new filter I need.”

## Chapter Four

- Summary
- ✓ **Certified operators are required for water utilities serving over 500 people and small water systems using surface water or groundwater under direct influence of surface water (GWUDISW).**
  - ✓ **There are five levels of certification including Operator-In-Training.**
  - ✓ **The tests for each level of certification are offered twice a year in Anchorage, Juneau, Fairbanks, and Prudhoe Bay.**
  - ✓ **Certificates are good for three years then must be renewed.**
  - ✓ **Thirty hours of training are required to renew a certificate.**
  - ✓ **Many training classes and materials are available to help you keep current.**

## Notes

[illegible]

## Notes

[illegible]



## Chapter Five

# Basics of Water Source Protection and Testing

## Water Sources

There are a variety of possible sources of water for a community, each with its own particulars. Some utilities get their water from groundwater wells while others draw water from lakes, rivers, or other surface water sources. A few use both.

It is vital that you know what contaminants could get in your water and their potential health effects. This is a matter of common sense. What is near your water supply that could contaminate the water? Are any chemicals stored nearby? Is there any fueling of aircraft, snow machines, cars, or machinery nearby? Where is your fuel tank farm in relation to your water supply? How close is your sewage lagoon or wastewater outflow to your water intake? Where are your honey buckets being dumped? How can your water source be protected?

If you are using a well, what kind of groundwater contamination might be possible? Was the area used as a dump during the Second World War? Were chemicals ever spilled in the area?

Because of a limited amount of fresh water in the area, some villages use water from more than one source. If this is the case in your village, you will have to be aware of what each source might mean to your operations.

What kind of a water source or sources you use will determine how you sample your water. There are three types of water sources defined by the regulations. You

Three types of water sources (sort of)

## Chapter Five

need to be aware of all three but realize that the last two are treated exactly the same so in effect there are only two types. The water source types regulated by ADEC are:

1. Groundwater, usually a well.
2. Surface water, such as a river or lake.
3. Groundwater under the direct influence of surface water, also known as GWUDISW.

GWUDISW exists where there is a mixing of groundwater and surface water. For instance, perhaps you have a shallow well or spring that is drawing water from a water table 20 feet below the surface. But the well or spring is very near a wetland, lake, or other surface water body. The surface waters could mix with groundwater in the nearby shallow well or spring because the surface water and groundwater are connected underground. Thus, your well water or spring could be affected by the water quality of the surface water. *Remember, GWUDISW is regulated just like surface water*, so the more frequent sampling requirements of surface water regulations apply rather than the simpler sampling requirements of true groundwater sources. If you think you have a groundwater source, but ADEC has determined that

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“Running a water utility means more than just keeping the pipes full of water. It means thinking ahead. For example, we have a dip bucket system. People come to a faucet and fill up buckets and take the water home. But it doesn’t matter how good the water is coming out of the faucet if the buckets are dirty. One of the ways I make sure that the water in the buckets is safe is to add a drop of bleach to each bucket of water that leaves the faucet. Yeah, it’s time consuming, but no one is getting sick and saying I should be fired. I kinda like this job.”

### Basics of Water Source Protection and Testing

you have a GWUDISW source, you will follow the sampling and testing requirements for surface water. ADEC will use field survey information and water test data to make the GWUDISW determination for you. You may have already been asked to send in information about your area soils, geology, wells, and surface waters to help ADEC make this determination.

We won't refer much to "groundwater under the direct influence of surface water" or its unwieldy acronym, GWUDISW, in the rest of the guide. Why not? *Because GWUDISW is regulated just like surface water! If you have a GWUDISW source, just think "surface water."*

Even though most of Alaska is pristine, and your watershed is probably wilderness, do not take anything for granted. Even from sources deemed "protected" by the state, there may be some problems. The greatest risks to health are microbiological contamination such as bacteria, viruses, and protozoa. People can get very sick and some may get hepatitis if microbiological contamination is not controlled. Pesticides and underground leakage can also foul your water. These pollutants show up as Volatile Organic Chemicals (VOCs) or Synthetic Organic Chemicals (SOCs) in your water and can cause cancer and other health problems.

Is your water source at risk?

Minerals like arsenic (a health concern) and iron (a nuisance) from area soils and rock may be dissolved in your water supply. Nitrate, an inorganic chemical that can have very serious health effects on babies, could enter your water from leaking underground septic tanks or leaking sewer lines. Finally, older piping may contain asbestos, lead, or lead solder. Brand new copper piping may raise levels of copper in the water until the insides of the pipes get covered with a protective scale. Excessive copper or lead leaching into the drinking water can, over long periods, give people serious health problems.

## Chapter Five

### Wellhead and Watershed Protection

ADEC has a program to identify contamination around your groundwater wells and watershed (the area that drains to your lake, river, or stream). If they find little potential wellhead or watershed contamination, ADEC may be able to waive or reduce some testing requirements. Contact ADEC Drinking Water Program to request an evaluation of potential contamination. Be sure to provide as much information to the ADEC staff as possible when they request it because this helps them in their evaluations. ADEC calls these evaluations “**susceptibility assessments**” (for groundwater sources) and “**source water assessments**” (for surface water sources).

### The Sanitary Survey

The two assessments just mentioned are one-time reviews of an entire region, looking for inherent problems with water supplies. The **sanitary survey** is a periodic checkup of an individual water system to identify problems, which may affect the safety of the water.

Systems providing drinking water from surface water or ground water under the influence of surface water (GWUISW) must complete a sanitary survey every three years. Utilities providing drinking water from a ground water source must complete a sanitary survey every five years. Water systems not wishing to do a sanitary survey can collect five total coliform bacteria samples per month. However, this could greatly increase testing expenses for the water system (estimated to be more than \$1,200 per year).

Qualified drinking water professionals, who have the expertise to spot potential problems with water sources, water treatment system, and piping, should conduct sanitary surveys. These include approved third party

### Basics of Water Source Protection and Testing

surveyors and water supply engineers, who charge for the service. ADEC Drinking Water Program and Statewide Public Service Office staff can complete the surveys for a lower fee. Communities served by a health corporation should be able to arrange a survey through their sanitarian. (Contact ADEC Drinking Water Program to obtain a list of people approved to conduct sanitary surveys.) After the sanitary survey is completed, ADEC will review it and determine if your existing system has potential compliance issues.

### Treated Water Testing

The federal government requires significant testing of drinking water. State agencies have to enforce those requirements. In 2000, the number of tests was increased substantially. While ADEC can issue waivers for certain pollutants not expected to be present, this should not lead you to believe that you do not need to test your water regularly. The best policy is to regularly test for any potential contamination using a schedule approved by ADEC.

Where you actually draw samples depends on what you are testing for. Some samples are collected at the intake to the utility while others are done after treatment, as the water is entering the distribution system (main pipes to customer homes). Some tests are done at customers' faucets in the distribution system. The frequency of the sample tests will also depend on what you are testing for and what type of system you have. The next three chapters will describe the tests in increasing detail.

We've broken the many possible tests into two basic types: operations and compliance. *Operations testing* is aimed at catching potentially big problems right away. Most are daily tests. *Compliance tests* are samples sent to a certified laboratory to analyze for a variety of

## Chapter Five

contaminants. Compliance tests are confirmation that your water is safe. Some of these tests are monthly, some only every few years. The next three chapters cover the tests. Chapter 6 covers operations testing, Chapter 7 compliance testing, and Chapter 8 provides more details about all the tests.

### Record and report the results

Recording the test data is just as important as testing. Unless there is a written record of the results of your samples, there is no way to track the unique characteristics of your utility. This could create problems for you when a new person does the testing. Say turbidity regularly runs a bit high at your utility at certain times of the year. Someone who is not aware of that may want to take extreme measures to discover why his or her turbidity is different than expected. If they can look back on the logsheets, they will see that it fits a normal pattern and can relax. So write down each test result on the logsheet right after you take it.

To comply with federal and state regulations, you'll need to send in a copy of your monthly report logsheet within 10 days of the last day of every month. See the sample logsheet in Chapter 6. Late reporting may require public notice (see Chapter 10 or call ADEC).

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“Sometimes being a water utility operator means educating the community. For example, we have a lot of people who will leave town for a week or so to shop or visit relatives. They come back in ten days, take a drink and get sick. Well, what happens is that the chlorine I put in the water is only good for a few days. If the water sits in the pipe for ten days, the chlorine becomes gas and comes out with the water when the faucet is opened. With no chlorine in the water, any germs that are there grow. So I suggest that anyone coming back after an absence let the water run a bit before taking a drink.”

### Basics of Water Source Protection and Testing

ADEC needs to know that regulated contaminants are below maximum contaminant levels (MCLs) so that human health is not at risk. If you do not comply with federal and state reporting requirements, you might wind up with a violation.

It is wise to maintain high standards for your testing. After all, the health of your village depends on it. Approximating test results does no one any good. Regular testing with correct methods and equipment ensures a good quality of water delivered to your customers. So, unless you have a waiver, follow the tests required by ADEC, as a minimum.

Maintain high standards

- ✓ **There are two basic types of water sources: groundwater and surface water.** Summary
- ✓ **There is also “groundwater under the direct influence of surface water” (GWUDISW), which is regulated just like surface water.**
- ✓ **A clean water source is vital—be aware of and deal with any possible contamination.**
- ✓ **Surface water, especially, must be treated to be safe.**
- ✓ **Have a sanitary survey done every three or five years depending on your drinking water source.**
- ✓ **Operations testing is intended to alert you to immediate circumstances that may indicate a problem.**
- ✓ **Compliance testing is done to assure that water is tested safe and results are recorded. It confirms that your system is operating properly.**
- ✓ **Record and report all operator-performed test results. Maintain high standards for the sake of your community health.**

## Notes

[illegible]



## Chapter Six

# Operations Testing

The operations tests, performed by water utility operators, are most important because they tell you on a daily or monthly basis how well your treated water (sometimes called “finished water”) meets safe levels. These tests must be done frequently so that corrective actions can be taken if something isn’t quite right. The tests you do depend on your water source type and treatment process.

### Daily Onsite Tests

If you are using surface water and disinfect using chlorine, you must test daily for turbidity and residual chlorine. If you are using GWUDISW, you must filter and disinfect the water and measure turbidity and disinfection.



If you have a groundwater source and disinfect with chlorine, ADEC may require you to test for residual chlorine daily, but not turbidity.



If you add fluoride to your water, you must do a daily fluoride test and report the results to ADEC.



In most instances, groundwater-only systems do not need disinfection. (However, in 2005 new rules may require many groundwater systems to disinfect.) If this is the case, chlorine is not added to your water, and no operator-performed tests or reporting is required.



### Monthly Coliform Test

Total coliform tests can be required once or twice a month or according to an ADEC schedule. Operators

## Chapter Six

should collect the water and send it to a certified laboratory for analysis. If your community population is over 1,000 (and up to 2,500 people), you need to do two coliform samples per month. Utilities serving fewer than 1,000 people may need to do only once test per month, and some utilities can get waivers from ADEC to test less frequently. You should contact ADEC to determine how often total coliform tests should be performed at your utility.

### Monthly Reports

List all the daily and monthly test results that are required by ADEC on your monthly report logsheet. Keep it short. There are several logsheets of varying complexity used by different size utilities. (The sample logsheet on the opposite page is just one of these.)

The monthly reports are your records, but a copy must also be delivered, mailed, or faxed to ADEC within 10 days of the end of each month. All too frequently utilities fail to send a copy of the monthly report logsheet to ADEC or turn it in late. Remember, ADEC needs the information for the entire month, not partial results.

### Safe Limits

These four tests: turbidity, residual chlorine, fluoride, and total coliform are the most important tests for making sure your system is operating properly and the quality of your water is safe. You always want to know what these parameters are so that when you make operational changes, water quality does not stray outside safe limits. The limits for each test are listed in the *Operations Water Tests and Safe Limits* table on page 58.

Testing is not a substitute for good operation. Rather, it is used for confirmation or indicator purposes.

## Operations Testing Daily Onsite Tests

### Example monthly report logsheet

<b>Alaska Department of Environmental Conservation</b> <b>Drinking Water Analysis Report for Chlorine Residual, Turbidity, &amp; Fluoride</b>											
Public Water System Name								PWSID #			
Address								Telephone / Fax			
City								For the Month of: Year			
AK											
State Zip											

Date	Type of Filtration Chlorine Residual at Entry Point	Turbidity After Filtration						Turbidity Limit	Daily Fluoride	N.T.U.	
		Turbidity After Filtration								Did You Filter	
		12-4 am	4-8 am	8am-12	12-4 pm	4-8 pm	8pm-12			Yes	No
1											
2											
3											
4											
5											
6											
7											
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28											
29											
30											
31											
Days >= 0.2		Total Samples Tested	A =		Samples <=1.49		B =				
Days < 0.2		Days <=1.49 NTU						Days Over 2.0 mg/l			
Total Days		Total Days						Total Days			

\* Enter 'NR' on days that system does not operate or when not filtering water

Major \_\_\_\_\_ Minor \_\_\_\_\_

Date Submitted : \_\_\_\_\_ Signature of Operator : \_\_\_\_\_

Page 1

## Chapter Six

### More on the Four Tests

#### Turbidity



*Turbidity* is a measure of suspended solids in your water. It is measured by shining a light into a sample and seeing how much is scattered versus passed through. Low turbidity (say 0.6 NTU) means not much light is scattered (the water looks clear). High turbidity (for example, 10 NTU) means much of the light is scattered (the water looks dirty or cloudy). Filtration is the most effective way to remove solids. Even filtered, all water has a certain amount of solids but the lower your turbidity

#### Operations water tests and safe limits

Test	Where is the test done?	Safe limit
Turbidity <sup>a</sup> (surface water sources only)	Onsite in the treatment plant (before treatment for unfiltered systems)	Standard safe limit is 1 NTU. <sup>b, c</sup> However, different filtration systems and systems avoiding filtration have varying safe limits. <sup>d</sup>
Residual Chlorine (if added)	Onsite in the treatment plant (daily)	Greater than 0.2 mg/l
	Onsite in the distribution system (when Total Coliform Test is done) <sup>e</sup>	Detectable amount
Total coliform bacteria	State-certified lab test (sample is collected in the distribution system)	Absence of coliform bacteria
Fluoride (if added)	Onsite in the treatment plant	Less than 2 mg/l (best operating range is 1.1 to 1.7 mg/l)

<sup>a</sup> The regulations require that a sample be collected every four hours, but most small systems can get this reduced to daily if they serve fewer than 500 people or use filtration other than conventional, direct, or diatomaceous earth.

<sup>b</sup> No more than 5% of the samples in a month can be over 0.5 NTU for conventional or direct filtration or over 1 NTU for other filtration technologies, and the average of two consecutive days of sampling cannot exceed 5 NTU.

<sup>c</sup> In 2005, no more than 5% of the samples in a month can be over 0.3 NTU for conventional or direct filtration.

<sup>d</sup> ADEC may increase or decrease turbidity limits on a case by case basis depending on an utility proving treatment efficiency.

<sup>e</sup> Preferably a sample at the customer's faucet farthest from the treatment plant.

### Operations Testing Daily Onsite Tests

count the better. High turbidity hampers the disinfection process since much of the chlorine will be wasted on the particles and not be available to kill bacteria. Another way to look at it is that the bacteria are “hidden” from the chlorine by the particles. Unusually high turbidity could indicate problems in the water supply. If the count jumps up unexpectedly, you should immediately inspect your water source. Have high water levels caused bank erosion? Has someone dumped something in the area? It is critical to monitor turbidity regularly so you can adjust your treatment process to match these conditions.

If the turbidity of your raw water runs significantly high, regulations require that a filtration system be installed. If you already have a filtration system, high turbidity levels may mean that your system needs to be serviced or improved. If you start to see high turbidity, you should contact ADEC to determine whether your treatment system needs changes.

Chlorine is used to disinfect the water—to kill bacteria, viruses, and protozoa. Chlorine can be added as a solid, liquid, or gas. The amount of chlorine added is dependent on a number of factors, such as the temperature, pH, and turbidity of the raw water.

Residual  
chlorine



There are two important considerations in chlorination. First, the chlorine must be in the water long enough to

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“I really didn’t care about turbidity until I found out why the turbidity test is so important. You see, all kinds of little tiny germs can hide around those suspended particles. If the chlorine cannot find the germs, it can’t kill them. The more particles there are—that is, the higher the turbidity—the more chlorine it’s going to take to kill all the germs. Now I’m REAL careful about my turbidity count. The health of my kids depends on it.”

## Chapter Six

reduce the microorganisms to a safe level. This is called **contact time**.

Secondly, there must be enough chlorine in the water so that as it is used up killing microorganisms while the water is going to the users. This is called **residual chlorine**. If residual chlorine measures OK at the plant but drops below safe levels at the last service connection, how can you be sure it didn't drop below a safe level before the last service connection? In other words, you need to make certain that the level of chlorine in the piping system is high enough to continue to kill new bacteria that may enter the system while it is being piped to each household. For this reason, it is critical to maintain the minimum 0.2 mg/l of residual chlorine entering the distribution system and a detectable amount through the entire distribution system. Test for it daily and carefully.

Total  
coliform



The presence of any **coliform bacteria** in your water should be a red flag to you. A certified lab does the coliform bacteria test (sometimes called “coli” or “bacti” for short). If any are detected (called a “positive” test), the laboratory will automatically test the positive coliform sample for the dangerous types of bacteria, such as **fecal coliform** or *E. coli*, and report the results to you and to ADEC. A positive total coliform test means that you, as the utility operator or manager, must call ADEC as soon as possible to determine what to do next. You will work with ADEC to take one or more of the following actions:

- Resample taking great care to do it right
- Evaluate the problem and provide an explanation to ADEC
- Increase sampling the following month
- Possibly post a public notice (for example, a Boil Water Notice)

### Operations Testing Daily Onsite Tests

With the proper concentration of disinfectant, your testing will reveal a consistent purity of water being pumped out to your customers. However, you should be aware that there is nothing constant in any water system. There are so many factors that affect water quality that there is no way to accurately predict the rate of coliform bacteria production.

Fluoride is an additive to the water that helps protect teeth from decay. If you add fluoride to your water supply, you have to test to make certain that the amount of fluoride in your water is both adequate and constant. The fluoride test is done onsite by a water treatment plant operator. Fluoride is added and monitored to keep it within a specific *range*. Too little fluoride won't do any good—children's teeth may not receive any protection from decay. Too much fluoride could cause mottling (brown stains on teeth), bone problems, and in extreme, over fluoridation could prove fatal.

Fluoride



Coordinate with your village health aide to make sure your children aren't getting too much fluoride. If the village health program sponsors a tooth fluoridation program and fluoride is added to the water supply, your children are probably getting more fluoride than they need.

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“Getting fluoride into the water is a matter of doing it exactly right. It's not as though a little is good and more is better. Fluoride is basically to strengthen the teeth of children, those under about 12 years of age. If you don't put enough fluoride into the water, it won't help one tooth in the village, and it will cost you money besides. If you put too much fluoride into the water, everyone's teeth will become mottled, grainy, and dark. Once that happens, everyone in town is going to blame you for ruining their good looks!”

## Chapter Six

- Summary
- ✓ **Operations tests are the most important tests because they tell you on a daily basis how well your water treatment is working.**
  - ✓ **The tests you do depend on your source water type and treatment process.**
  - ✓ **The turbidity, residual chlorine, and fluoride tests are done daily onsite.**
  - ✓ **The total coliform test is done at least monthly or according to an ADEC schedule by a certified lab.**
  - ✓ **The monthly report logsheet must be kept and a copy sent to ADEC within 10 days of the end of each month.**



## Notes

This image shows a single page of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

## Notes

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## Chapter Seven

# Compliance Testing

In addition to the operations tests outlined in the last chapter, there are a handful of other tests that must be done at a certified laboratory. Details on each test will be covered in Chapter 8. Compliance testing is to confirm that your system is operating properly and to make sure no contaminant has shown up in your water unexpectedly. This chapter covers the general procedures for compliance testing and stresses some important points to remember. It also includes a flow chart for routine compliance testing (*Water Utility Typical Sampling Locations*) and one for when tests come back out of acceptable limits (*Compliance Monitoring Basics*).

## Choosing Labs

Compliance testing can only be done by a laboratory certified by ADEC. There are only a few such labs in Alaska. Laboratories are certified to test for certain contaminants. For example, only a few labs in the state are certified to do synthetic organic chemical (SOC) analyses—such as pesticides and polychlorinated biphenyls (PCBs). Check ADEC’s list of certified laboratories before sending your water to a lab. A list of certified laboratories and the tests they are certified to do is provided in Appendix D. It may work out to use one lab for some tests and another for others.

The cost of testing will vary from laboratory to laboratory, so it is suggested that you “shop around” before committing yourself to any one lab. Call several certified labs and ask for their price list for the required tests. (In some regions, health corporations may offer

## Chapter Seven

subsidized coliform testing.) Check to make sure the lab is state-certified. And check from time to time to make sure you are still getting a good value for your money; remember, good service is important too.

### Taking the Samples

Before you sample There are several planning tasks that must be done before you collect your samples:

- Secure the funds to pay for required lab tests. Make the financial commitment to keep a proper testing program going.
- Order sample bottles and paperwork from the lab well ahead of time. With some tests, it is a good idea to keep a few extra sample bottles on hand—just in case you have to redo a sample.
- Schedule sampling so an express parcel delivery service can get the samples to the lab right after sampling. Be sure to take the weather into account. It does you no good to send a sample that will not arrive on time.

Six important points Before you start gathering samples for compliance tests, there are six critical matters to keep in mind.

1. ***Maintain a clean environment.*** Wash your hands thoroughly before collecting samples. This includes cleaning under fingernails, particularly when collecting coliform samples. Make sure the sink is clean (no meat or blood from cleaning game or fish). Remove the aerator from the sink faucet and avoid sampling from swing faucets. These rules are especially important for coliform, VOC, and lead/copper sampling.
2. ***Collect sample from the correct location.*** Samples must be collected from specific locations. For example, coliform samples must be collected from

## Compliance Testing

the distribution system (closest to customer use) rather than back at the treatment plant. See *Water utility typical sampling locations* on the next page for required sample locations.

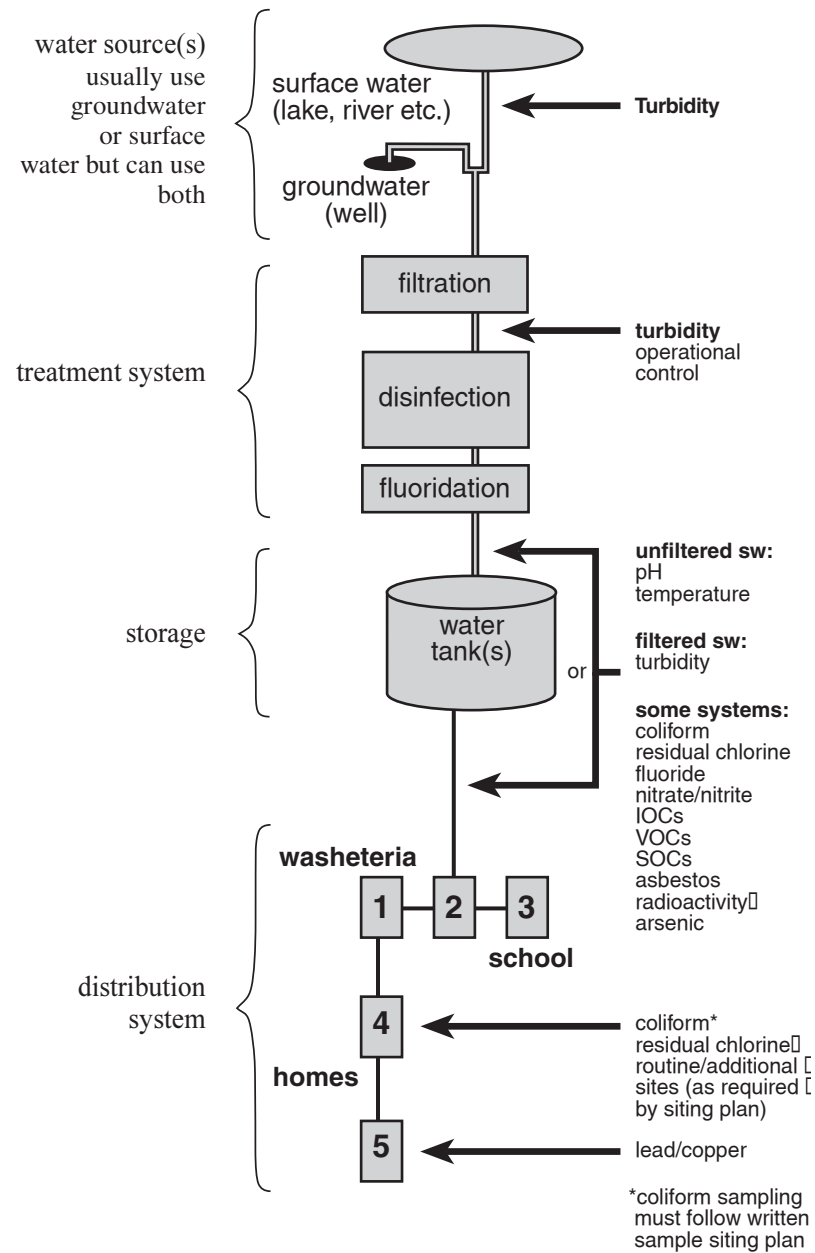
3. ***Do not rinse any sample container*** you receive from the laboratory. Some of the sample containers have preservatives in the bottle that keep the sample just as it was when you collected it from your water system. Be careful that the sample bottle does not overflow, as this could wash out the preservatives. The laboratory expects to find those preservatives in the sample analysis.
4. ***Label every sample*** with the utility name and public water system (PWS) number, phone number, your name, and date and time of collection. Write legibly with waterproof ink. If any of your writing cannot be clearly read, the laboratory could refuse to test the sample and ask for another one. If there's a mix-up at the laboratory, you want to make sure that the chemists can distinguish between your sample and anyone else's.
5. ***Maintain and ship all samples cooled but not frozen.*** Samples must arrive at the lab unfrozen, but no warmer than 39 degrees Fahrenheit. Frozen samples could result in cracked sample bottles or loosened bottle caps. The lab will mark these samples "invalid"

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"One time I did something really stupid. I was taking a water sample when I accidentally let some of the water run over my fingers before it went into the bottle. 'No big deal,' I thought. Well, it was. And an expensive one, too. I didn't have to redo just the one sample. Noooo. I had to redo it a whole bunch of times so the lab could be sure that whatever was on my fingers wasn't actually in the water supply. That cost money. Guess what? I don't put my fingers in the water any more."

## Chapter Seven

### Water utility typical sampling locations



## Compliance Testing

and will not test them. Wrap each bottle or container in bubble wrap. Then pack the samples with “blue ice” packs in the shipping container (usually a cooler supplied by the testing lab).

6. ***Schedule your sampling so the specimen arrives at the lab in time*** to be tested and not over a weekend or holiday. A coliform sample ***MUST BE TESTED WITHIN 30 HOURS OF COLLECTION***. If this presents a hardship due to your remote location, call ADEC. The laboratory provides the chain of custody form (see example on next page), sample bottles, labels, blue ice and shipping containers (usually coolers), and sometimes, sample instructions and precautions. ***YOU MUST REQUEST AND RECEIVE THIS EQUIPMENT FROM THE LAB BEFORE YOU COLLECT SAMPLES***. Then follow their instructions.

## Maintaining the Chain of Custody

It is important that you understand and maintain the **chain of custody**. The chain of custody ensures that your samples are collected, packaged, sent, transported, and received properly with no contamination, tampering, or delay between your sampling and the laboratory’s testing. An example chain of custody record from a lab is shown on the next page. On the chain of custody form,

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“When it comes to sampling, what you do after you get the water in the bottle is just as important as getting the water there in the first place. One time I left the coliform sample on a window sill for three hours before the plane came to the village. That cooked whatever was in there and I had to send another set of samples – and we had to pay for both sets. That’s the last time I ever did that. Now I take my samples and put them in the refrigerator until the plane comes. And I always call to make sure the plane is even coming before I sample.”

list all of the samples taken, along with the date, time, and exact location of each sample, the PWS ID number, and number of sample containers you used.

[illegible]



## Comparing Results to Safe Limits

Compliance tests that must be done in a certified lab are:

1. Coliform Bacteria (covered in Chapter 6)
2. Nitrate and Nitrite
3. Inorganic Chemicals (IOCs)
4. Volatile Organic Chemicals (VOCs)
5. Synthetic Organic Chemicals (SOCs)  
(for example, pesticides and PCBs)
6. Lead and Copper
7. Asbestos
8. Radioactivity
9. Arsenic
10. Disinfectants and Disinfectant By-products

No one in the village has more control over good health than the water treatment operator. Supplying bad water can make the whole village sick.

Test results must be compared to state and federal safe limits, called maximum contaminant levels (MCLs). MCLs are available from ADEC and are listed for each contaminant in Chapter 8, *Details on the Tests*.

If test results are above MCLs, you will need to work with the ADEC Drinking Water Program staff for follow-up compliance requirements. Your lab will probably call you *and* ADEC when they get results over the MCLs. But don't wait for a call back from ADEC if results exceed MCLs. Examples of follow-up actions ADEC may recommend include:

- Resample immediately
- Increase sampling frequency
- Post a public notice
- Find an alternate water source (serious cases only)
- Install additional water treatment (serious cases only)

## Chapter Seven

Remember, you need to contact ADEC immediately and follow their recommendations for follow-up actions. Do not install new treatment processes without first going through the ADEC plan approval process.

Also, in many cases, test results come back with levels that indicate a concern, but the levels are not higher than MCLs. These warning levels are called “trigger levels” or “action levels” in the regulations. “Trigger levels” (for fluoride, nitrate/ nitrite, VOCs, and SOCs) and “action levels” (for lead and copper) are available from ADEC and are also listed in Chapter 8. If your test results are higher than trigger levels, contact ADEC for follow-up requirements.

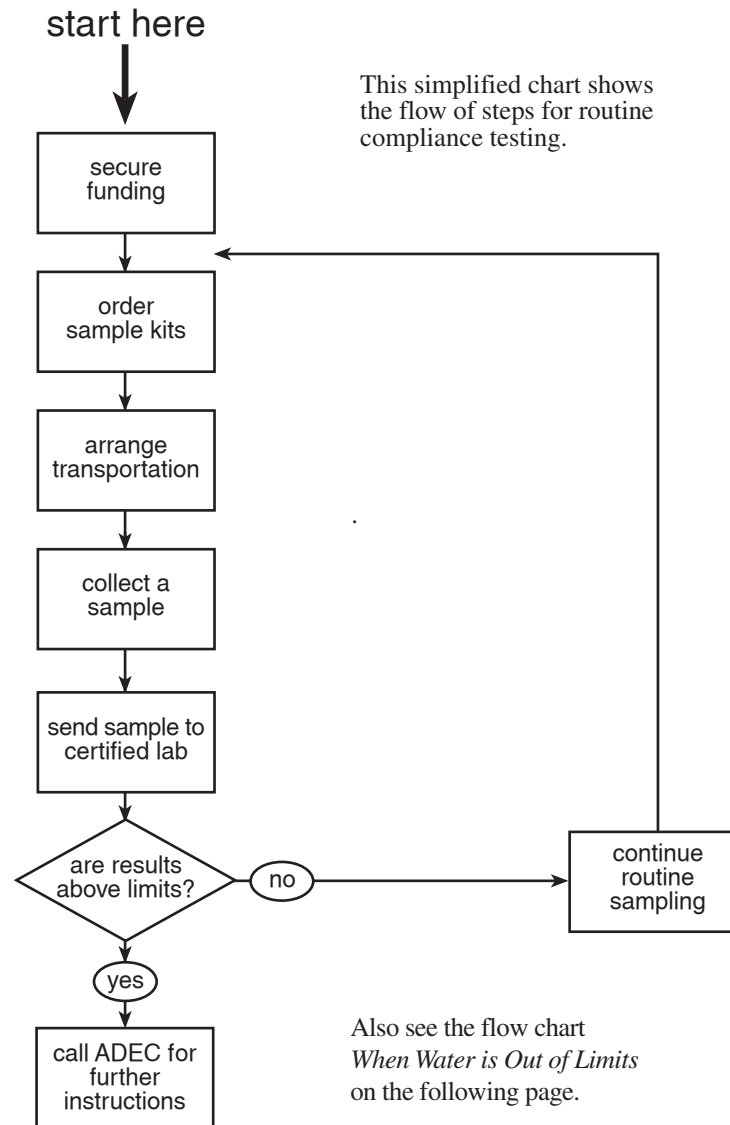
## Exceptions to the Requirements

There are four types of exceptions to compliance testing: **waivers, grandfathering, variances, and exemptions.** In addition, composite sampling allows a simplification in procedure in a multiple sample situation. It should be made quite clear that these exceptions do not allow you to deliver unsafe water. Rather, exceptions take into account your local circumstances versus expensive test requirements. You need to ask ADEC for exceptions; they are not automatically granted.

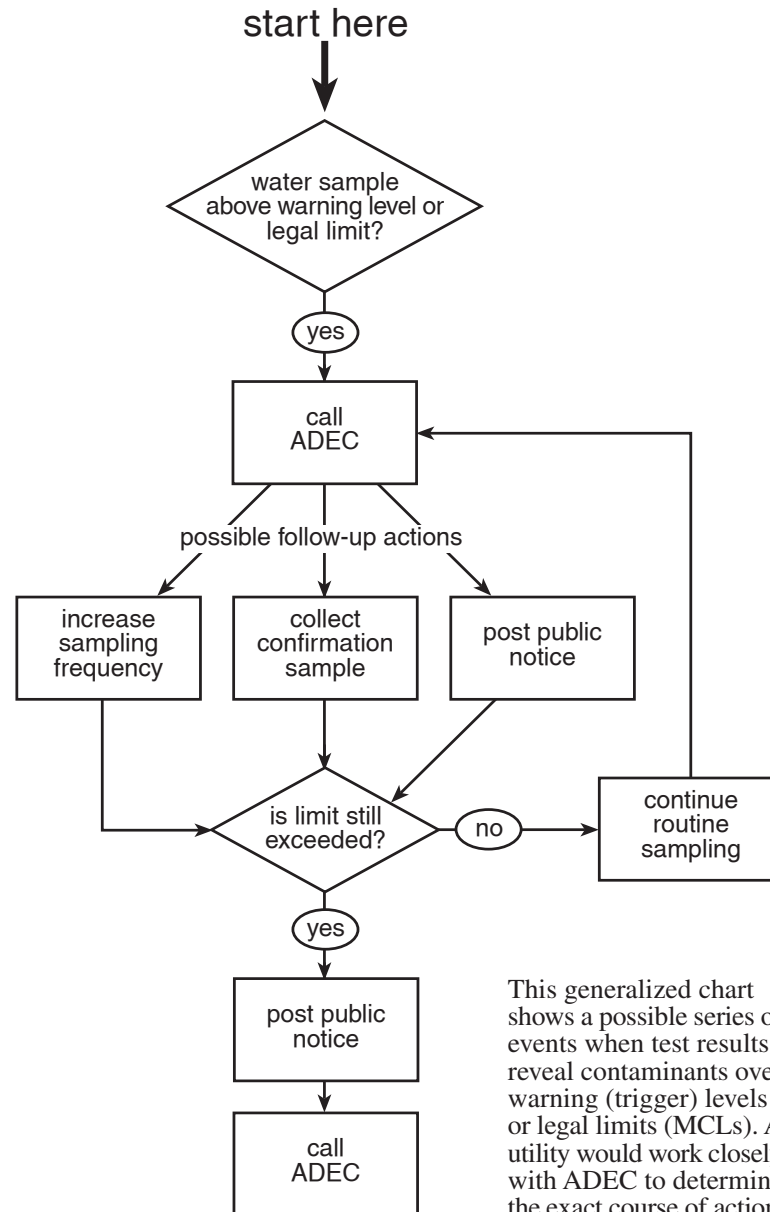
**Waivers** ADEC issues waivers for specific contaminants, sometimes for the entire state, sometimes for specific areas of the state. Waivers mean you don’t have to test for the contaminants listed in the waiver, or you may be able to reduce the frequency of testing. You have to apply for a waiver from the ADEC Drinking Water Program, and you might have to pay a fee, but in the long run, a waiver will save you a lot of money.

Waivers are available for single contaminants, such as asbestos and dioxin (one of the SOCs). And waivers

Compliance monitoring basics



When water is out of limit



## Compliance Testing

are available for groups of contaminants, such as IOCs. If you are issued a waiver, make sure you know when you need to renew it. Depending on the contaminant, waivers need to be renewed every three to nine years. Contact ADEC for details.

Grandfathering is a little known exception you may be able to use when a new test requirement comes along. Grandfathering means you may use old test results (taken several years ago) to satisfy new test requirements, as long as the test methods, detection limits, sample locations, and sampling techniques satisfy the new test requirements. Call ADEC for details if you think you want to use this exception. Grandfathering may be possible for your VOC, SOC, or asbestos requirements.

Grandfathering

Variances apply to MCLs. If a water system can't meet an MCL, but the water is still considered safe and the population is not in danger, ADEC may grant a variance for the MCL. If you are granted a variance for an MCL, you will be required to post public notice and may be required to use bottled water or different treatment devices (such as filters on water taps) as a condition of the variance. Variances are issued for specific periods of time. Variances are also granted for treatment techniques. Contact ADEC for details.

Variances

Exemptions also apply to MCLs. If a water system can't meet an MCL, but could if given time to address the problem, ADEC may grant an exemption to the MCL. If you are issued an exemption, you will be issued a compliance schedule (usually no more than one year) and must post a public notice. You may be required to use bottled water or different treatment devices (such as filters on water taps) as conditions of the exemption. Contact ADEC for details. Exemptions are also granted for treatment techniques. Again, contact ADEC for details.

Exemptions

## Chapter Seven

Composite sampling is available in two situations but only if first approved by ADEC. Utilities with more than one water source may collect a sample from each source and instruct the lab to composite them. The lab will mix the samples together and run only one test, saving you money. A variation of compositing is allowed for radioactivity tests. For the first four quarters of testing, ADEC may allow you to collect one sample each quarter, but wait to the end of the year and send them in together.

*In both cases, it is important to remember that only the lab may do the actual mixing.*

### Testing overview

Contaminant	Sample location	Composite sampling?	Waivers possible?
Turbidity	After treatment <sup>a</sup>	No	Yes <sup>b</sup>
Residual Chlorine	After treatment (daily)	No	No
	Distribution system (monthly)	No	No
Total Coliform Bacteria	Distribution system (sample siting plan)	No	No
Fluoride (if added)	After treatment	No	No
Nitrate	After treatment	No	No
Nitrite	After treatment	No	No
Old Inorganics (IOCs)	After treatment	No	Yes
New Inorganics (IOCs)	After treatment	No	Yes
Volatile Organics (VOCs)	After treatment	Yes	Yes <sup>c</sup>
Synthetic Organics (SOCs)	After treatment	Yes	Yes
Lead/Copper	Distribution system <sup>d</sup>	Yes	No
Asbestos	Distribution system or source	No	Yes
Radioactivity	After treatment	Yes	Yes <sup>e</sup>
Stage 1 Disinfectants and Disinfection By-products	After treatment <sup>f</sup>	No	No
Arsenic	After treatment	No	No

<sup>a</sup> Unfiltered surface water may also be sampled at the source.

<sup>b</sup> Depending on filtration technique

<sup>c</sup> For a reduction in frequency only. More waivers likely in the near future.

<sup>d</sup> **First draw** (where water has been sitting in the pipes for a minimum of 6 hours).

<sup>e</sup> For a reduction in frequency only.

<sup>f</sup> Total organic carbon samples at the source and after treatment.

## Overview of Drinking Water Tests

The table on the opposite page summarizes sample locations and composite sampling and waiver options for all the drinking water tests. Chapter 8 will cover all the tests in more detail, including sampling frequency.

- ✓ **Compliance testing is a check for various contaminants that could show up in your water.** Summary
- ✓ **Compliance testing can only be done by a laboratory certified by ADEC.**
- ✓ **Shop around for a lab (or labs) that meets your needs at a fair price.**
- ✓ **Get a “monitoring summary” from ADEC specifically for your utility.**
- ✓ **Plan out your test strategy, including funding, timing of sample kits, and transportation issues.**
- ✓ **Observe the six critical matters in this chapter when taking samples.**
- ✓ **Maintain a proper chain of custody with samples.**
- ✓ **Compare test results to safe limits and take appropriate action.**
- ✓ **Obtain waivers, grandfathering approval, variances, or exemptions when necessary and appropriate.**

## Notes

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## Chapter Eight

# Details on the Tests

The operations and compliance tests mentioned in prior sections of this guide are explained in more detail in this chapter. The turbidity and residual chlorine tests are explained under the Surface Water Treatment Rule (SWTR). The summary of the Disinfectants and Disinfectant By-products Rule (D/DBPR) explains some new rules for testing.

To simplify things, we've assumed that your utility has only one water source. ***If your utility has more than one water source, contact ADEC for the appropriate water sample location(s).*** You may be able to use composite sampling. When it comes to sampling frequency, surface water sources are usually tested more often than groundwater sources. Surface water sampling frequencies are usually listed separately from groundwater sampling frequencies in this chapter.

In general, if an MCL is exceeded, you should contact ADEC immediately and work out what to do next with a Drinking Water Program staff specialist.

### Surface Water Treatment Rule (SWTR)

*What is the issue?*

Surface water is usually considered more susceptible to contamination than groundwater. In general, surface water will have more debris and dirt particles (higher turbidity) and biological contamination. The surface water treatment rule requires a minimum level of

## Chapter Eight

treatment so that bacteria, viruses, and protozoa in your water supply are killed.

Bacteria, viruses, and protozoa can cause severe stomach and intestinal diseases and can even kill those with weak defenses (including babies, the elderly and anyone with an existing illness). Parasites live off your body and can really knock you down. Diseases caused by these germs include hepatitis, Cryptosporidiosis, and Giardiasis. Symptoms of these diseases include yellow skin, headaches, nausea, gas, and vomiting.

*How do these microbes get into the water?*

Bacteria, viruses, and protozoa are usually introduced to water from contact with human and animal wastes. They could get into the water from upstream villages, dog lot runoff, leaking septic or sewage systems, sewage systems too close to water sources, and droppings from infected animals (like waterfowl) in the watershed.

*What is the minimum treatment required for surface water?*

If you are using surface water for your water supply, you should be filtering your water, then disinfecting it with a chemical like chlorine. Other disinfectants such as ozone and chloramine are also used, but not commonly in Alaska. Make sure you have enough disinfectant in the water so the bacteria, viruses, and protozoa are killed. The amount of disinfectant remaining after the disinfection process is called “residual chlorine concentration” and must be at least 0.2 mg/l entering the distribution system.

Also in the surface water treatment rule are the requirements that **all** Class A public water utilities regardless of size and Class B drinking water systems using surface water or GWUDISW employ a *state-certified* operator. See Chapter 4 for details on certification and training.

## Details on the Tests

*What, where, and when do I test the surface water samples? How many samples do I collect?*

### Surface water treatment rule testing—filtered systems

(Contact ADEC for unfiltered system testing)

Test	Sample Frequency	Sample Location
Turbidity	Daily <sup>a</sup>	After treatment□□
Residual Chlorine□ Water plant	1 per day under 500 people 2 per day 501-1,000 people <sup>b</sup> 3 per day 1001-2,500 people <sup>b</sup> □□	At the entry point to the□ distribution system
Residual Chlorine□ Distribution system (associated with coliform sample)□ □	1 per month (or 2 per month for systems serving 1,001-2,500)	At the same place the total coliform sample is taken in the distribution system, preferably at the customer's tap farthest away from the treatment plant

See Chapter 6 for MCLs on these tests and the next table for turbidity MCLs.

<sup>a</sup> The basic regulation requires testing every 4 hours.

<sup>b</sup> ADEC may reduce to one per day for systems serving up to 1,500 people.

*Is there anything special I should know about surface water sampling?*

These tests are all performed onsite. It is important to increase the sampling frequency to every 4 hours if the residual chlorine concentration goes below 0.2 mg/l. Also, ADEC must be notified if the residual chlorine concentration is not back above 0.2 mg/l within 4 hours.

***Always do the residual chlorine test within 15 minutes of collecting the sample.***

If you wait longer, the result may be lower than the water system's actual (or "real time") concentration. You are required to keep a daily logsheet and send in a monthly report of all the daily test results that are required for "compliance." ADEC requires that test results be submitted to their office *every month*. The report must arrive by the 10th day of the next month or you are in violation.

## Chapter Eight

*What surface water test result triggers a dangerous water quality condition?*

### Exceeding turbidity MCLs

Treatment technique	Trigger level	Maximum Contaminant Level (MCL)	Action required
Any treatment	5 NTU <sup>a</sup>	5 NTU (average of two consecutive days)	Call ADEC
Conventional or direct filtration (sand filtration, slow sand filtration, rapid sand filtration)	0.5 NTU <sup>b</sup>	95% of samples must be less than 0.5 NTU	Call ADEC
Other filtration technologies (membrane filters, biofilm filtration)	1 NTU	95% of samples must be less than 1 NTU	Call ADEC
Any waterborne disease outbreak	Any	Not applicable	Notify ADEC as soon as possible

<sup>a</sup> also the violation level

<sup>b</sup> will be reduced to 0.3 NTU in 2005.

*Are there any special requirements or considerations for the surface water treatment rule?*

There are no variances for disinfection. It must be done if you use a surface water source. If your system has received a filtration waiver, there are special conditions that must be met. Contact ADEC for details.

*What else might be required if I can't meet MCLs for turbidity or residual chlorine?*

Additional or more advanced treatment technologies may have to be installed if the filtration and disinfection treatment techniques do not adequately protect your community's health.

## Disinfectants and Disinfection By-Products (D/DBP) Rule

**Note:** The new Disinfectants and Disinfection By-Products Rule (D/DBPR) was finalized in 1998. Drinking water utilities serving less than 10,000 people will need to comply with the rule by January 2003.

*What is the issue?*

Disinfection by-products (DBPs) are produced when disinfectants are added to drinking water to kill microorganisms. Disinfectants (like chlorine and chlorine dioxide) react with naturally occurring organic and inorganic material and can cause the formations of D/DBPs (like trihalomethanes and haloacetic acids).

While elimination of microorganisms in drinking water is beneficial to public health, the formation of D/DBPs needs to be closely monitored to avoid adversely affecting public health. Ingestion drinking water with D/DBPs above the MCL limits can affect the liver, kidneys, central nervous system, and increase the risk of cancer.

*How do D/DBPs get into the water?*

D/DBPs get into the water when chlorine is added to kill microorganisms. Organic and inorganic matter naturally occur in the water. The chlorine can react with this material and create DBPs.

*Could D/DBPs really be a problem in my water supply?*

Yes, surface water sources with high concentrations of algae and grass are susceptible to the DBPs. Groundwater sources can also be susceptible.

## Chapter Eight

### *Where do I collect D/DBP samples?*

You take the collection of most samples at the same place as the monthly coliform samples (within the distribution system). The only exception is the test for Total Organic Carbon, which is tested both in the source water and the treated water.

### *When do I collect D/DBP samples?*

The sampling frequency for D/DBPs are listed below. However, you should check with ADEC to make sure your compliance schedule is correct.

#### D/DBP sampling frequency

Chemical	Sampling Frequency
<b>DISINFECTANTS</b>	
Chlorine	monthly
Chloramines	monthly
Chlorine Dioxide	daily
<b>DISINFECTION BY-PRODUCTS</b>	
Total Trihalomethanes (TTHMs)	quarterly
Haloacetic Acids (HAA5)	quarterly
Chlorite	daily
Bromate	monthly (ozone systems only)
Total Organic Carbon	monthly□□

### *Is there anything special I should know about D/DBP sampling?*

When sampling, it will be helpful for the operator to note raw water and treated water turbidity. Also note the weather conditions (such as sunny, rainy). By knowing what the raw water and treated water conditions are, the operator may be able to correlate the D/DBP test results. If the test samples are high, it may correspond to a high runoff event, or an algae bloom in the water system. The operator can then adjust treatment next time around.

## Details on the Tests

*What result triggers a water quality alarm for D/DBPs?*

### D/DBP MCLs

Chemical	MCL (mg/L)
<b>DISINFECTANTS</b>	
Chlorine	4.0
Chloramines	4.0
Chlorine Dioxide	0.8
<b>DISINFECTION BY-PRODUCTS</b>	
Total Trihalomethanes (TTHMs)	0.080
Haloacetic Acids (HAA5)	0.060
Chlorite	1.0
Bromate	0.010
Total Organic Carbon	Treatment technology <sup>a</sup>

*Are there any special requirements or considerations for D/DBPR sampling?*

In January 2003, the requirements for this law will apply to small systems. Before January 2003, the requirements apply only to those systems over 10,000 people.

*What else might be required if I can't meet MCLs for D/DBPs?*

If a water system can't meet MCLs then there are various actions an operator can take to reduce the formations of D/DBPs. You should talk with ADEC to solve the problem.

### Total Coliform Rule (TCR)

*What is the issue?*

The coliform bacteria test is an indicator test that warns you something harmful to human health may be present in your water. Having some coliform bacteria is not *necessarily* harmful, but their presence indicates there may be a problem with water treatment or distribution,

## Chapter Eight

and that some of the *dangerous* strains could have gotten in. Symptoms of coliform illness include diarrhea, cramps, nausea, and associated headaches and fatigue.

If the test result says coliform are present in the sample (called a *positive* result), the lab will continue with analysis of the same sample, testing for fecal coliform or *E. coli*. If fecal coliform or *E. coli* are present, the risk of getting sick is much higher. *E. coli* are very dangerous organisms to have in your water. Keep in mind that coliform results are *indicators* of problems and are usually “too little, too late.” They are not a preventive measure. Regular disinfectant testing (the residual chlorine test) shows whether adequate protection is being maintained and is the best way to prevent a bacteria problem from developing.

*How do coliform bacteria get into the water?*

Coliform bacteria occur naturally in soil and water. Fecal coliform bacteria are spread through human and animal wastes. They could get into the water from dog lot runoff, leaking septic or sewage systems, or any carrier animal, dead or alive in the watershed. They could come from an upstream village that discharges sewage into the river, or any number of other sources.

*Where do I collect total coliform samples?*

Coliform samples must be collected in the distribution system in accordance with a written **sample siting plan** (see Appendix C). At least five sample locations need to be identified, carefully mapped, and given identification numbers in the written sample siting plan. The extra sample locations are required even though only one or two samples are routinely required per month. The extra locations are designated in case repeat samples or additional routine samples are required after a positive coliform test result. Sample locations must be representative of the water being delivered to the customer—customer taps are the usual locations.



## Details on the Tests

*How many coliform samples do I collect and when?*

Depends on number of people served as follows:

### Total coliform sampling frequency

Number of people served	Numbers of samples required	Action Required
25-1,000	1 per month <sup>a</sup>	Call ADEC
1,001-2,500	2 per month (on separate days) <sup>a</sup>	Call ADEC

<sup>a</sup> Remember, for systems that chlorinate, collect a residual chlorine sample at the same place and time you collect each coliform sample. Analyze residual chlorine within 15 minutes of sample collection. Include the residual chlorine value on coliform lab paperwork.

*Is there anything special I should know about coliform sampling?*

A written sample siting plan must be prepared for every water system. This plan shows exactly where the routine samples will be collected and where the alternate repeat/routine samples will be collected in case a sample comes up positive. See the example sample siting plan in Appendix C.

When you request sample bottles from the lab, make sure they know whether or not you chlorinate your water. If you do, they will add a dechlorinating agent to your sample bottles so the chlorine in your sample won't interfere with the sample result. A coliform sample must be collected in a sterile bottle that contains at least 100 ml of sample. When collecting the sample, be extra careful not to touch the inside of the bottle or bottle cap. It is very easy to contaminate a coliform sample with bacteria from your hands, faucets (especially swing faucets or a faucets with a removable nozzles), and tabletops. Bacteria exist in very large numbers on these types of surfaces. Also, do not put the bottle cap in your pocket or on a counter while you are collecting the sample. Hold the cap in the hand that isn't holding the sample bottle. Remove faucet aerators and screens before

## Chapter Eight

collecting a coliform sample and do not collect a sample from a swing faucet or faucets with a removable nozzle.

***Always have extra coliform bottles on hand.*** It is very important to have at least five extra sample bottles onsite at all times. If a sample result comes up positive at the lab, you may have to collect three or four more samples (called *repeat* samples) within 24 hours of receiving notice of the positive results. (Be sure to keep these bottles closed and clean and ask the lab how long you may keep these bottles before the dechlorinating agent is no longer effective—the “shelf life” of reserve sample bottles.) The written sample siting plan should identify the repeat sample locations.

If you ever have a positive coliform sample (a “hit”), an increased number of samples must be collected in the following month to make sure the system is being operated safely and/or the source water is clean. Five routine samples are required in the month following a positive result. Call ADEC for help.

***Note:*** If there is only one service connection in the community (such as a washeteria dispensing point), the following samples must be collected after a positive total coliform analysis:

- One 100 ml sample on each of 4 separate days, OR
- Two 200 ml samples on 2 separate days, OR
- One 400 ml sample on 1 day

*What result triggers a water quality alarm for coliform?*

A positive total coliform result (test result says coliform bacteria are “present”) triggers:

- A call to ADEC
- Repeat sampling
- Fecal coliform or *E. coli* analyses (performed on the same sample in the lab)

### Details on the Tests

- Possible public notice
- Increased routine sampling in the month following the positive coliform result

***Call ADEC immediately if the lab calls and tells you your total coliform result is positive.***

Results may also be deemed invalid by the laboratory due to questionable sampling technique, sample temperature being too cold or too warm when delivered, or other reasons that the lab will specify. If the sample is deemed invalid, another sample must be collected as soon as possible. Contact ADEC for details.

### Coliform action levels and MCLs unsatisfactory levels

Contaminant	Unsatisfactory level	Action required if above unsatisfactory level	MCL is exceeded if:	Action required if MCL exceeded
Total coliform	Presence	Repeat sampling within 24 hours □	More than one sample per month is positive	Call ADEC, possible public notice
Fecal coliform	Presence	Repeat sampling within 24 hours	A repeat sample is fecal positive; A routine positive fecal sample is followed by a repeat total coliform positive □ □	Call ADEC, possible public notice (acute violation)

*Are there any special requirements or considerations for coliform sampling?*

- There must be a written sample siting plan.
- It is very important to do the repeat and follow-up sampling and timely public notice.
- Contact ADEC immediately with questions.
- No waivers are allowed.
- No grandfathering of prior sample results is allowed.

## Chapter Eight

*What else might be required if I can't meet the MCL for coliform?*

If your water contains coliform above the MCL, people in the community may need to boil their water until the problem is fixed. Contact ADEC before taking any action. A **Boil Water** notice may need to be issued and the community has the option of providing each person bottled water for drinking and cooking. ADEC may require more follow-up testing instead of the Boil Water notice.

## Fluoride (F)

*What are the concerns?*

Fluoride is found in water sources in some areas but not usually at levels beneficial to dental health. Some public water systems add it to their water to strengthen teeth and reduce the number of cavities, especially in young children. If too little is added, it is a waste of money. But too much fluoride can be harmful (see Chapter 6).

***Remember: Fluoride is not the same as chlorine. These two chemicals are frequently confused.***

*What kind of training does the fluoride treatment operator need?*

A fluoridation system operator is required to be qualified according to federal rules by passing a state exam on surface water treatment. See Chapter 4, *Operator Certification and Training*, for details.

*When, where, and how many fluoride samples do I collect?*

If you add fluoride to your water supply, collect one fluoride sample per day after treatment. Record fluoride concentrations on a daily logsheet and report fluoride test results to ADEC in the monthly report.

### Details on the Tests

Test by measuring the fluoride ion concentration of your sample using onsite test equipment and chemicals.

*What result triggers a water quality alarm for fluoride?*

Understand your “ideal” or “target” fluoride level for your facility. This level should be less than the trigger or MCL level mentioned below. Operators typically maintain fluoride levels of 1.1 to 1.7 mg/l. A sample result that is greater 2.0 mg/l may require an increase in sampling frequency or a sample sent to a certified laboratory for confirmation. A sample result that exceeds the MCL (4.0 mg/l) triggers a public notice. Call ADEC if you exceed a trigger level or MCL.

### Fluoride summary

Chemical	Trigger level (regulated value)	Action required if trigger level is exceeded	MCL	Action required if MCL is exceeded
Fluoride □	2 mg/l □	Call ADEC, possible public notice so children under the age of nine can drink from an alternate water source □	4 mg/l	Call ADEC, possible public notice, danger to adults as well as children

*Are there any special requirements or considerations for fluoride sampling and testing?*

Be careful to use the right measuring tools that have been properly calibrated. Get a representative sample. Make sure fingerprints and smudges are wiped off the sample and calibration tubes before putting them into the spectrophotometer.

*What else might be required if I can't meet MCLs for fluoride?*

If your water contains fluoride above the MCL, public notice may be required. If the water has extremely high fluoride values, *immediately* consult ADEC for proper action to take, as this could be very dangerous.

## Chapter Eight

### Nitrate and Nitrite ( $\text{NO}_3/\text{NO}_2$ )

*Why are nitrate and nitrite a problem?*

Nitrate in drinking water can cause “blue baby” syndrome or methemoglobinemia (lack of blood oxygen). Nitrate converts to nitrite in the body; nitrite interferes with the oxygen-carrying capacity of the child’s blood. This condition can cause serious illness and even death in children under six months old. If you think this serious medical condition has developed, contact a health professional *immediately*.

*How do nitrate and nitrite get into the water?*

The most common source of nitrate is septic tank effluent (outflow). Nitrates are also found in fertilizer, agricultural areas, spilled sewage areas, and in natural deposits. When any of these substances are dumped or stored too close to a water supply, there may be pollution. If you are planning community buildings or facilities, make sure that there is a proper distance between any storage facility or sewage system and your water supply. Also remember, once you construct a storehouse, there is no guarantee what will be stored there in five or six years, particularly if the next generation of residents is unaware how close the building is to the water supply.

*Where do I collect a nitrate/nitrite sample?*

Collect the sample after treatment, at the entry point to the distribution system.

*When and how many nitrate/nitrite samples do I collect?*

#### Nitrate ( $\text{NO}_3$ ) sampling frequency

Water source	Sample frequency
Surface water	Once per quarter for a year, afterward ADEC □ may reduce to once per year□□
Groundwater□	Once per year□□

## Details on the Tests

### Nitrite (NO<sub>2</sub>) sampling frequency

Water source	Sample frequency
Surface water	Once, then maybe again at ADEC discretion
Groundwater	Once, then maybe again at ADEC discretion

*Is there anything special I should know about nitrate or nitrite sampling?*

A nitrate sample will be collected in either a glass or plastic 10-ml bottle preserved with sulfuric acid. A nitrite sample will be collected in either a glass or plastic 50-ml bottle with no preservative. (You get these bottles from the lab.) Carefully note sample locations on the chain of custody form. Keep an extra sample bottle onsite for nitrate because, if a result comes back over 10 mg/l, a confirmation sample may be requested by ADEC within 24 hours of learning about the high result.

*What result triggers an alarm regarding water quality?*

A sample result that is greater than the trigger level listed below requires an increase in sampling frequency. A sample result that exceeds the MCL for nitrate triggers a public notice and the requirement to provide an alternate water source for your customers (such as bottled water). ***Call ADEC if you exceed a trigger level or MCL.***

### Nitrate/nitrite summary

Chemical	Trigger level (mg/l)	Action required if above trigger level	MCL (mg/l)	Action required if MCL is exceeded
Nitrate (NO <sub>3</sub> as N)	5.0	Increase sampling frequency	10.0	Public notice and alternate water supply
Nitrite (NO <sub>2</sub> as N)	0.5	Increase sampling frequency	1	Public notice and alternate water supply
Total NO <sub>3</sub> /NO <sub>2</sub> as N	5.0	Increase sampling frequency	10	Public notice and alternate water supply

## Chapter Eight

*Are there any special requirements or considerations for nitrate or nitrite sampling?*

No waivers are allowed. No grandfathering of prior sample results is allowed. Nitrite has a very short holding time, meaning that the nitrite tends to convert quickly to nitrate. So don't let this sample sit around—it needs to get to the lab now.

*What else could be required if I can't meet MCLs for nitrate or nitrite?*

You would need to correct the situation. This might mean installing an ion exchange or reverse osmosis water treatment process or locating a new water source. It is that important.

## Lead and Copper (Pb/Cu)

*What are lead and copper problems?*

High levels of lead in the blood can be very harmful. Young children are especially vulnerable and easily harmed. Lead may interfere with physical and mental development in children. High values of copper can also cause stomach and intestine distress and liver and kidney damage.

*How do lead and copper get into the water?*

Lead may leach out of solder and other pipe materials into drinking water. Copper may leach out of copper pipes into drinking water. Sometimes lead and copper occur naturally in source water, although this is not common.

*Where do I collect the lead/copper samples?*

In customer's homes, at bathroom or kitchen sink cold-water faucets, or wherever water is taken for regular use.



## Details on the Tests

*How many lead/copper samples do I collect?*

Depends on population. See the following table. ADEC can help with details.

Lead/copper number of samples

Number of people served	Initial number of samples	Reduced number of samples
100 or less	5	5□□
101-500	10	5□□
501-3,300	20	10□□

*When do I collect lead/copper samples?*

In the first year you would collect samples once every six months (called **initial sampling**). In the second and third year you should collect samples once per year (called **annual sampling**). You may also be able to reduce the number of sample sites in conjunction with ADEC. After three years, you may be able to further reduce sampling to once every three years.

*Is there anything special I should know about lead/copper sampling?*

Samples must be **first-draw** samples—these are the first water samples drawn from the cold water tap after water has been sitting still in the pipes for at least six hours. A single sample for both lead and copper may be collected in one-liter plastic sample bottle provided by the lab. Sample should be preserved with nitric acid. Ask your lab to provide sample bottles that comply with the lead/copper rule. You must carefully identify and number your sample locations and try to pick those that will still exist years from now (don't pick a spot that may be torn down in five years). Use the lead/copper rule guidance to identify proper sample locations or call ADEC for assistance. ***Note: Do not change sample locations without getting approval from ADEC.***

## Chapter Eight

Samples should be collected from locations determined during a plumbing survey. Locations chosen are those most likely to have a problem, such as places with lead soldered pipes, copper pipes, brass faucets, or other fixtures made from lead or copper alloys. The idea is if they are OK, then other spots probably are too.

*What result triggers an alarm regarding lead/copper water quality?*

Greater than 10 percent of the sample results exceed the “action level.” (If one or more out of ten samples is over the “action level”—OR—if you take only five samples, if the average of the two highest results exceeds the “action level.”) MCLs have not been set for lead or copper. Instead, action levels are followed.

### Lead/copper action levels

Chemical	Action level (mg/l)	Action required
Lead	0.015	Contact ADEC for further requirements.
Copper	1.3	Contact ADEC for further requirements.

*Are there any special requirements or considerations for lead/copper sampling?*

Contact ADEC for special requirements or considerations.

*What else might be required if I can’t meet MCLs for lead or copper?*

If lead or copper levels exceed their action levels, sampling for other chemicals (water quality parameters) will be required. In this case, you would work with ADEC to meet these requirements. Public education may be required for lead problems. Corrosion control treatment or source water treatment may be required if the lead or copper levels continue to exceed action levels.

## Inorganic Chemicals (IOCs)

*What are IOCs, and why are they a problem?*

Inorganic chemicals, known as IOCs, are metal or mineral elements and their compounds. IOCs have been known, over time, to damage kidneys, liver, heart, intestines, brain, lungs, circulatory systems, and nervous systems. Barium can contribute to high blood pressure. Cyanide can damage the brain, spleen, and liver and can even be fatal. Regulated inorganic chemicals are listed toward the end of this section.

*How do IOCs get into the water?*

IOCs get into water sources by dissolving out of mineral deposits and soil, primarily natural sources. They are also found in areas with mining, manufacturing of fertilizers, and in paint.

*Where do I collect IOC samples?*

Collect IOC samples after treatment at the entry point to the distribution system.

*When do I collect IOC samples?*

IOC sampling frequency

Water source	Routine sample frequency	Waiver possible?
Surface water	Once every year	Once per nine years if 3 annual samples show less than MCLs
Groundwater	Once every compliance period	Once per nine years if 3 compliance samples show less than MCLs

*Is there anything special I should know about IOC sampling?*

Several different containers might be used to take the required sample. These might be glass or plastic bottles, or plastic cubitainers. Most of the sample water should be preserved with nitric acid, except the bottles that

## Chapter Eight

will be tested for cyanide and mercury. Cyanide sample bottles should contain sodium hydroxide preservative. The lab should add the proper preservative to the sample bottles before they are shipped to you, but it never hurts to ask the lab to do this. Carefully note sample locations on chain of custody forms.

*What result triggers a water quality alarm for IOCs?*

A sample result that is greater than the maximum contaminant level (MCL) for an IOC chemical should be confirmed by additional sampling and increased sampling frequency. Public notice may be required. Call ADEC if you exceed an MCL.

### IOC MCLs

Chemical	MCL (mg/l)	Chemical	MCL (mg/l)
Cadmium (Cd)	0.005	Antimony (Sn)	0.006
Chromium (Cr)	0.1	Beryllium (Be)	0.004
Mercury (Hg)	0.002	Cyanide (CN)	0.2
Selenium (Se)	0.05	Nickel (Ni)	0.1
Barium (Ba)	2.0	Thallium (Tl)	0.002

*Are there any special requirements or considerations for IOC samples?*

Waivers are possible. A waiver may be obtained by paying a fee and filling out an ADEC waiver application form (not very hard, call ADEC for help). An IOC waiver can be good for nine years. At least one sample needs to be collected during the waiver period and you must reapply for the waiver every nine years.

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“Before I take any water samples, I call the airport. If the plane isn’t coming in, I don’t take samples. If I can’t get my samples to the lab they are going to come back, and I’ll have to pay transportation charges for extra samples. My village doesn’t have enough money to waste. So I carefully plan when I am going to take samples.”

### Details on the Tests

While composite sampling can be granted by ADEC, it is usually not. Typically, at least one IOC will be detected in a composite sample, requiring a repeat sample for each of the sample points to determine if an MCL is exceeded, and if so, where. Use of grandfather results is allowed. Three sample results from prior years (“grandfather samples”) may be used to support the first monitoring waiver. Contact ADEC for details. The grandfather samples must have been collected in the time frames listed below to apply toward the waiver.

### IOC grandfather requirements

Chemical	At least one grandfather sample must have been collected	Two other grandfather samples must have been collected
Cd, Cr, Hg, Se, Ba	After 1/1/90	After 6/24/77
Sn, Be, CN, Ni, Tl	After 1/1/90	After 1/1/88

*What else might be required if I can’t meet MCLs for IOCs?*

If your water contains IOCs above MCLs, public notice may be required. Extra treatment might be required to remove them. Some possible treatments to remove IOCs are activated alumina, coagulation/filtration, granular activated carbon, ion exchange, lime softening, reverse osmosis, electrodialysis, or chlorine oxidation.

## Arsenic (As)

**Note:** Specific information has been provided on arsenic because of the change to the MCL, outlined in the Arsenic Rule finalized in January 2001 and effective in 2006.

*What is arsenic, and why is it a problem?*

Arsenic is a metal that is found in some ground water supplies and an occasional surface water supply. Arsenic is known to cause cancer and may harm the lungs and skin.

## Chapter Eight

### *How does arsenic get into the water?*

As groundwater travels through the earth, it comes into contact with many different minerals. Arsenic is one of those naturally occurring metals that may dissolve into the water. Once arsenic is dissolved in groundwater, it tends to stay in solution.

### *Could arsenic really be a problem in my water supply?*

Arsenic is more of a problem for groundwater sources. Also, certain areas of Alaska, such as the interior, are more prone to arsenic.

### *Where do I collect an arsenic sample?*

Samples are collected at the entry point to the distribution system, unless otherwise specified by ADEC.

### *When do I collect an arsenic sample?*

One sample is required after the effective date of the rule (January 23, 2006). Class A surface water systems must take annual samples. Class A groundwater systems must take one sample between 2005 and 2007. If the initial monitoring result for arsenic is less than the MCL (0.010 mg/l), Class A ground water systems must collect a sample every three years. Class A surface water systems must collect an annual sample. If the Class A water system exceeds the MCL, sampling may have to increase to quarterly. Class B systems are not regulated by the new arsenic rule.

### *Is there anything special I should know about arsenic sampling?*

Waivers may be permitted depending on sample results. In addition, water systems may grandfather old arsenic testing results, if approved by ADEC.

### *What result triggers a water quality alarm for arsenic?*

Results over the MCL (0.010 mg/l) are cause for alarm. Depending on the results, specific statements must be

### Details on the Tests

included in the water systems Consumer Confidence Report (CCR, see Chapter 9). After July 1, 2002, for CCR reports covering calendar years 2001 and beyond, systems that detect arsenic between 0.050 mg/l and 0.10 mg/l must include an educational statement in the CCR. Between July 1, 2002 and July 1, 2006, for reports covering calendar years 2001-2005, systems that detect arsenic between 0.10 and 0.50 mg/l must include a health effects statement in their CCRs.

*Are there any special requirements or considerations for arsenic sampling?*

There are no special requirements or considerations for arsenic sampling.

*What else might be required if I can't meet MCLs for arsenic?*

Changes to the treatment system may be required if the system cannot meet the MCLs for arsenic. Contact ADEC with your questions.

## Volatile Organic Chemicals (VOCs)

*What are VOCs, and why are they a problem?*

Volatile Organic Chemicals, also known as Volatile Organic Compounds, are carbon-based chemicals that evaporate rapidly into the air. Many things you might use in your garage—parts washing fluids, fuel additives (such as benzene in gasoline, solvents, paint thinner, etc.)—contain VOCs. VOCs are regulated by their chemical names (see *SOC MCLs*, page 104). VOCs can cause cancer and may damage the kidney, liver, circulatory, and nervous systems.

*How do VOCs get into the water?*

VOCs can leak into drinking water sources or could contaminate groundwater if they are spilled or seep into the soil. VOCs could leak from underground or above

## Chapter Eight

ground storage tanks or result from poor chemical handling procedures (such as spills while filling a tank).

*Could VOCs really be a problem in my water supply?*

VOCs have been found in water supplies throughout Alaska. VOCs are present in gasoline and other common fuels and in many chemicals regularly used around workshops and homes. But if you believe VOCs could not possibly be present in your water, you may want to contact ADEC for a possible reduction in sampling frequency.

ADEC allows waivers for VOC sampling for water systems with groundwater sources that did not detect VOCs in their initial quarterly sampling. For surface water systems, a waiver could be issued to decrease sampling frequency or to allow composite sampling. When determining whether to give a waiver, ADEC looks at whether the system is at risk to VOCs contamination. For example, ADEC looks at how close possible contamination is to the water source. Waivers usually last about three years. If you receive a waiver for VOCs, you must work with ADEC to update the application before your waiver period runs out—or you may have to do annual sampling again.

*Where do I collect a VOC sample?*

Collect VOC samples after treatment, at the entry point to the distribution system.

*When do I collect a VOC sample?*

When your system is first set up, quarterly samples are required. After a year (and if quarterly sampling does not show VOCs in the water), samples are collected once per year for surface water sources, and once every three years for groundwater sources.



## Details on the Tests

### VOC sampling frequency

Water source	Initial sample frequency	Routine sample frequency
Surface water	Four quarters for one year	Once per year
Groundwater	Four quarters for one year	Once per compliance period

*Is there anything special I should know about VOC sampling?*

Sample must not contain any bubbles in the full sample bottles. VOCs could vaporize into the air bubble in the sample bottle and lead to an incorrect result in the lab. Let the lab know if you chlorinate your water. They will add a special preservative to the sample bottles if you do chlorinate. A single sample may be collected in small (40 to 120 ml) sample vials. These are sample bottles with special TFE- fluorocarbonlined caps. Sample should be preserved with hydrochloric acid. The lab usually adds this preservative to the sample bottles before sending them to you, but it never hurts to verify this. Carefully note sample location on the chain of custody form.

*What result triggers a water quality alarm for VOCs?*

Very small concentrations of VOCs are harmful to human health (specifically MCL concentrations). Because of this, even lower concentrations, or “trigger levels,” are used as warning concentrations. If test results show that even a trace of a VOC chemical is in your water supply, contact ADEC for further requirements. Sampling frequencies may be increased, investigations may be conducted to find and clean up a contamination source, or plans may be made to design and construct additional water treatment. If sample results exceed MCLs, public notice may be required. Call ADEC if you have questions.

*Are there any special requirements or considerations for VOC sampling?*

Instead of sampling and testing each water source, you

## Chapter Eight

may ask ADEC if you can take a “composite sample” option for up to five water sources. Only a certified lab is allowed to composite the samples. Note sample locations on the chain of custody form. Use of grandfather results is allowed. Sample results from prior years (“grandfather samples” taken between 1/1/88 and 10/1/93) may be used as partial compliance with new sampling requirements. Call ADEC for details.

*What else might be required if I can’t meet MCLs for VOCs?*

If your water contains VOCs above MCLs, public notice and/or remediation may be required. Treatment methods for removing VOCs from water include granular activated carbon or packed tower aeration.

### VOC MCLs

Chemical	Trigger level (mg/l)	MCL (mg/l)
Benzene	0.0005	0.005
Carbon Tetrachloride	0.0005	0.005
1,2-Dichloroethane	0.0005	0.005
1,1-Dichloroethylene	0.0005	0.007
Para-Dichlorobenzene	0.0005	0.075
1,1,1-Trichloroethane	0.0005	0.2
1,1,2-Trichloroethane	0.0005	0.005
Trichloroethylene (TCE)	0.0005	0.005
Vinyl Chloride	0.0005	0.002
Othro-Dichlorobenzene	0.0005	0.6
Cis-1,2-Dichloroethylene	0.0005	0.07
Trans-1,2- Dichloroethylene	0.0005	0.1
1,2-Dichloropropane	0.0005	0.005
Ethylbenzene	0.0005	0.7
Chlorobenzene	0.0005	0.1
Styrene	0.0005	0.1
Tetrachloroethylene (PCE)	0.0005	0.005
Toluene	0.0005	1.0
Xylenes(total)	0.0005	10.0
Dichloromethane	0.0005	0.005
1,2,4- Trichlorobenzene	0.0005	0.07

## Synthetic Organic Chemicals (SOCs)

*What are SOCs, and why are they a problem?*

Synthetic Organic Chemicals, known as SOCs, are man-made chemicals such as pesticides, herbicides, PCBs (polychlorinated biphenyls), and chemicals found in coal tar linings and sealants. SOCs are regulated by their chemical names (see *SOC MCLs*, page 107). SOCs can cause cancer and can damage kidneys, liver, testes, the gastrointestinal tract, and reproductive organs. These chemicals can also damage the nervous system and circulatory system.

*How do SOCs get into the water?*

Pesticide residues could get into surface water or groundwater from farmland runoff. PCBs are found in fluids used in old electrical equipment (transformers), and can enter water supplies through improper disposal of equipment. Chemicals from leaking equipment could contaminate soil and leach down into the water supply. Other SOCs can enter the environment from improper wastewater disposal at chemical factories or from leaking equipment at old military facilities.

*Could SOCs really be a problem in my water supply?*

It is not likely that you will have these chemicals in your water supply unless you live near an industrial or agricultural area or old military site. Contact ADEC for a possible waiver from SOC sampling (see *special requirements* section, next page).

*Where do I collect an SOC sample?*

Collect your SOC sample after treatment at the entry point to the distribution system.

## Chapter Eight

*When do I collect an SOC sample?*

Sample frequencies are summarized here. Call ADEC for waivers, grandfather options, and other details.

### SOC sampling frequency

Water source	Initial sample frequency	Routine sample frequency
Surface water	Four quarters for one year, unless grandfathered	Once every compliance period
Groundwater	Four quarters for one year unless grandfathered	Once every compliance period

*Is there anything special I should know about SOC sampling?*

Let the lab know if you chlorinate your water so they can add a special preservative to the sample bottles. Note your sampling location on the chain of custody form.

*What result triggers a water quality alarm for SOC?*

Very small concentrations of SOC are harmful to human health (MCL concentrations). Because of this, even smaller concentrations, “trigger levels,” are used as warning concentrations. If test results show that even a trace of an SOC chemical is in your water supply, contact ADEC for further requirements. Sampling frequencies may be increased, investigations may be conducted to find and clean up a contamination source, or plans may be made to design and construct additional water treatment. If MCLs are exceeded, public notice may be required. MCLs and trigger levels are listed in *SOC MCLs*, opposite.

*Are there any special requirements or considerations for SOC sampling?*

Composites are allowed. Instead of sampling and testing each water source, you may ask ADEC if you can take the “composite sample” option for up to five water sources. Only a certified lab is allowed to mix

## Details on the Tests

### SOC MCLs

Chemical	Trigger level (mg/l)	MCL (mg/l)
2,3,7,8-TCDD (Dioxin)	1x 10 <sup>-8</sup>	3x10 <sup>-8</sup>
2,4,5-TP (Silvex)	0.0004	0.05
2,4-D (Formula 40, Weedaar 64)	0.0002	0.07
Acrylamide <sup>a</sup>	Depends on type of water treatment. Contact ADEC for MCL for your system.	Depends on type of water treatment. Contact ADEC for MCL for your system.
Alachlor (Lasso)	0.0004	0.002
Aldicarb Sulfone <sup>a</sup>	0.003	0.003
Aldicarb Sulfoxide <sup>a</sup>	0.004	0.004
Aldicarb <sup>a</sup>	0.002	0.002
Atrazine (Atranex, Crisazina)	0.0002	0.003
Carbofuran (Furadan 4F)	0.002	0.04
Chlordane	0.0004	0.002
Dalapon	0.002	0.2
Di(2-ethylhexyl) adipate	0.001	0.4
1,2-Dibromo-3-chloropropane (DBCP) (Nemafume)	0.00004	0.0002
Di(2-ethylhexyl) phthalate (DEHP)	0.001	0.006
Dinoseb	0.0004	0.007
Diquat	0.0009	0.02
Endothall	0.02	0.1
Endrin	0.00002	0.002
Epichlorohydrin	Depends on type of water treatment. Contact ADEC for MCL for your system.	Depends on type of water treatment. Contact ADEC for MCL for your system.
Ethylene Dibromide (EDB) (Bromofume)	0.00002	0.00005
Glyphosate	0.01	0.7
Heptachlor (H-34, Heptox)	0.00009	0.0004
Heptachlor Epoxide	0.00004	0.0002
Hexachlorobenzene	0.0002	0.001
Hexachlorocyclopentadiene (HEX)	0.0002	0.05
Lindane	0.00004	0.0002
Methoxychlor (DMDT, Marlate)	0.0002	0.04
Oxamyl (Vydate)	0.004	0.2
PAHs (Benzo(a)pyrene)	0.00004	0.0002
PCBs (Polychlorinated Biphenyls) (Arochlors)	0.00009	0.0005
Pentachlorophenol	0.0002	0.001
Picloram	0.0002	0.5
Simazine	0.0002	0.004
Toxaphene	0.002	0.003

<sup>a</sup> Pending national review.

## Chapter Eight

the samples. Note sample locations on the chain of custody form.

Waivers are possible. Since the first year of SOC sampling can cost up to \$6,000, you probably want to look into a waiver. To apply for a waiver, contact ADEC, fill out an application and pay the fee. On the application you will submit information on your water usage as well as potential contamination sources surrounding your water source. If there is any chance a surrounding contamination source (such as a landfill or cemetery) might be polluting your water supply, ADEC may ask for at least one test before issuing the waiver. SOC waivers are good for three years, then you must reapply.

Use of grandfather sample results is allowed. Sample results from prior years (“grandfather samples” taken after July 1, 1990) may be used as partial compliance with new sampling requirements. Call ADEC for details.

*What else might be required if I can’t meet MCLs for SOC’s?*

If your water contains SOC’s above MCLs, a public notice may be required. Remediation may be required. Treatment methods for removing SOC’s from water include granular activated carbon, packed tower aeration, or chlorine or ozone (for glyphosate).

## Asbestos

*Why is asbestos a problem?*

Asbestos may increase the risk of cancer over long periods of time.

*How does asbestos get into the water?*

Asbestos enters drinking water from natural mineral deposits or asbestos-cement pipes used to carry water.

## Details on the Tests

*Could asbestos really be a problem in my water supply?*

Your water system was probably constructed long after asbestos-cement pipe was used. For this reason, you may be eligible for an asbestos monitoring waiver (see *special requirements* section, next page).

*Where do I collect an asbestos sample?*

If you do need to collect an asbestos sample, the sample location depends on where the asbestos is likely to come from in your system. If it might be present in source water, then a sample should be taken at the entry point to the distribution system. If your system has asbestos-cement piping or if the corrosivity of the water is high, then the sample must be taken at a customer tap served by asbestos-cement piping.

*When do I collect an asbestos sample?*

Once in the first three years, after which a nine-year waiver may be available.

*What result triggers an alarm regarding water quality for asbestos?*

A sample result that exceeds the MCL for asbestos may require a confirmation sample, an increase in sampling frequency, and a public notice. Call ADEC if you exceed the MCL.

### Asbestos MCL

Chemical	MCL	Action required if above MCL
Asbestos	7 million fibers/L (Longer than 10 micrometers) <sup>a</sup>	Call ADEC

<sup>a</sup> Fibers this long are the ones that may increase the risk of cancer.

## Chapter Eight

*Are there any special requirements or considerations for asbestos sampling?*

Waivers are allowed. Contact ADEC with information about your pipe materials and area geology, including soils. No fee is required for an asbestos waiver. The waiver is good for nine years and will save you the expense of asbestos testing.

Use of grandfather samples is allowed. If the grandfathered sample is collected after **July 1, 1990**, it may be used to support a monitoring waiver.

*What else might be required if I can't meet the asbestos MCL?*

If your water contains asbestos above the MCL, public notice may be required. Remediation may also be required, such as replacing asbestos-cement pipe or installing corrosion control or filtration.

## Radioactive Materials

*Why are radioactive materials a problem?*

Radioactivity (radiation) from these materials may lead to cancer, particularly bone cancer in humans.

*How do radioactive materials get into the water?*

Radionuclides are radioactive particles that occur naturally in areas of uranium and radium deposits. Man-made radiation is caused by power plant operations, weapons testing fallout, and wastewater disposal from some industrial processes. You will be looking for the naturally occurring radionuclides in Alaska.

*Where do I collect a radioactivity sample?*

Collect your sample after treatment at the entry to the distribution system.



## Details on the Tests

*When do I collect a radioactivity sample?*

### Radioactivity sampling frequency

Water source	Sample frequency	Action if MCL exceeded
Surface water	Every four years	Call ADEC□□
Groundwater	Every four years	Call ADEC□□

*What radioactivity concentration is harmful to water quality?*

In radioactivity testing, samples are analyzed for gross alpha radiation. If the gross alpha radiation concentration exceeds the MCL (see following table), the same water sample is further tested for Radium 226. If the Radium 226 concentration exceeds the MCL, call ADEC to determine follow-up actions. Generally, sampling frequency will be increased, both Radium 226 and Radium 228 will need to be tested, and all the results are compared to federal MCLs. If sample results exceed federal MCLs, public notice will be required. In rare cases, water treatment may need to be installed, or an alternative water source may need to be obtained. Call ADEC if results exceed MCLs.

### Radioactivity MCLs

Test	MCL	Possible follow-up action
Gross alpha radioactivity (including radon and uranium) □□	15.0 pCi/l	Test sample for Radium 226 and call ADEC
Combined radium-226 and radium-228	5.0 pCi/l	Call ADEC about possible increased sampling frequency, testing for more parameters, comparing results to federal MCLs, and public notice.□□
Uranium□	0.030 mg/L	Call ADEC□□
Beta particle and photon radioactivity	4 mrem/year	Call ADEC

pCi/l = picoCuries/liter

## Chapter Eight

*Are there any special requirements or considerations for radioactivity sampling?*

Composite samples may be allowed. Instead of sampling and testing each water source, you may ask ADEC if you can take the composite sample option for up to five water sources and have a lab mix them together before testing the sample, and save on test costs. Waivers are possible for reduced sampling frequency only. Grandfather sampling is not allowed.

*What else might be required if I can't meet radioactivity MCLs?*

If your water contains radioactivity above MCLs, public notice may be required. Remediation may also be recommended and could include aeration or granulated activated carbon treatment.

- Summary
- ✓ **The tests outlined in this chapter screen your water for many harmful substances.**
  - ✓ **Review the tests and keep track of when they are coming up.**
  - ✓ **Request a “monitoring summary” from ADEC tailored to your utility.**
  - ✓ **Make sure lab kits get ordered and tests get done when they need to be completed.**
  - ✓ **Analyze the results and note any problems.**
  - ✓ **Take appropriate action if levels are exceeded.**
  - ✓ **Waivers, grandfather samples, or composite samples are sometimes allowed.**

## Notes

[illegible]

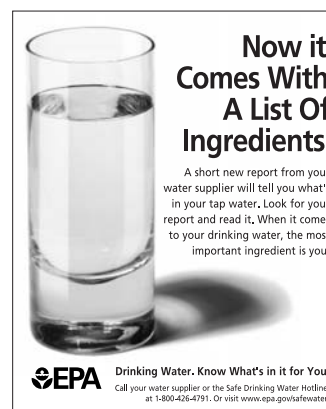
## Notes

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## Chapter Nine

# Consumer Confidence Reports

Customers have the right to know what is in their drinking water and where it comes from. The 1996 Amendments to the Safe Drinking Water Act require water systems with 15 or more service connections or serving 25 or more people to provide the community with a brief water quality report. These yearly reports, called Consumer Confidence Reports (CCRs), must include background information on any substances that have been found in drinking water and whether the water is safe to drink.



CCRs help people understand their drinking water quality and allow them to make health-related choices related to their water. CCRs also help the community to realize the difficulties behind delivering safe drinking water. This helps you since educated people are more likely to value the true costs of providing safe drinking water. Also, people are more likely to protect their drinking water sources (like the rivers or lakes near the community) when they are aware of the concerns.

## CCR Distribution

Every water system must deliver a CCR to each customer by **July 1** of each year. Each report must include data from the previous calendar year (January-December). If your system is new, the first CCR should be sent out July 1st after the first full calendar year of operation and annually thereafter.

## Chapter Nine

Most water systems send out the CCR with a water bill. This may not work for your system. If you have customers prepay several months, self haul water, or pay only when service is received, you may have problems getting a copy to every customer. Instead, you may want to try these ideas for getting your CCR out to the community:

- Send the CCR to all the post office boxes in town.
- Post the CCR in places that people visit often, like the city office, tribal office, store, post office, church, etc.
- Leave a stack of CCRs in public places where people may pick them up, like city or tribal offices, community centers, etc.
- Place a radio or cable TV advertisement telling people that the CCRs are available at the water system office.
- A copy of the CCR and the signed/dated Certification of Distribution must be sent to ADEC by the July 1 deadline to get credit for the regulatory requirement.

CCRs summarize much of the information that your water system already collects to comply with regulations. You should not need to do any new monitoring—just report on what you’ve been doing for the past year.

### CCR Requirements

CCRs are required to include information about your water source, the levels of any detected contaminants, and compliance with drinking water rules, plus some educational material. Most reports are only a few pages. In fact, a report that contains *too much* information or is full of technical jargon will probably keep people from reading the report.

To make community members want to read the report, your CCR should be personalized for the community. To do this, include photos, figures, tables, and graphics that make the information easier to understand. The CCR can have additional information if you want, as long as it does not take away from the purpose of the report.

While water utilities can write their reports in any useful way, each report must provide the following information

## Consumer Confidence Reports

about the drinking water they provide. Templates are available. (Visit <http://www.epa.gov/safewater/ccr1.html> for more information.)

### Include this information in the CCR:

The community should know how to get information on the water system including:

Water system information

- Name and phone number of the water utility contact person.
- Public meetings or other public education events to learn more about the utility and drinking water.
- Ways that non-English speakers can get information. (If your community is primarily English speaking, you do not need to include this.)

Give information on where your community's drinking water comes from including:

Water source information

- Type (lake, stream, well, etc.), name, and location of water source(s).
- How to get a copy of the source water assessment.
- Information on major sources of possible contamination, if available.

There are many words and abbreviations used in water treatment that people might not know. You should explain any technical words or terms that are in the CCR.

Important definitions

Your CCR should explain if any contaminants were found during testing throughout the year. The report should have:

Contaminants found in the drinking water

- An explanation of the highest levels of contamination and the range levels of contaminants found.

## Chapter Nine

- A table summarizing data on detected regulated and unregulated contaminants.
- The known or likely source of each detected regulated contaminant.
- For MCL violations (see Chapters 5 and 6), explain potential health effects.

Information on  
*Cryptosporidium*  
and other con-  
taminants,  
if applicable

If you monitored for *Cryptosporidium* or other contaminants and did not detect them, you do not need to include this information. However, if you did detect something, include this information:

- The values or levels reported to you by the lab.
- Why people may need to be concerned about the results.

Compliance  
with other  
drinking water  
regulations

If your water system violated any rules during the past year, your CCR should explain:

- Each violation.
- Potential health effects of each violation.
- Steps taken to correct the problem.
- Explanations of any variances or exemptions to drinking water regulations.

Educational  
information

There are some statements that your CCR should include to give basic information about the drinking water and contaminants (visit <http://www.epa.gov/safewater/ccr1.html> for more information). These statements include:

- Explanations of contaminants and their presence in drinking water.
- A warning for vulnerable populations about *Cryptosporidium*.
- Informational statements on arsenic, nitrate, and lead.



## Consumer Confidence Reports

Finally, your CCR can include any other information that you think will help people understand their water system and what you do to bring them safe, clean water.

### Helpful Hints

The purpose of the CCR is to give community members information about their water system that they can understand. Try to make the report as simple to read as possible by:

- Not using too many technical words, abbreviations or jargon that people can't understand (If you must use them, include their definition).
- Using tables, figures, and other graphics to help you get your information across.
- Keeping sentences and paragraphs short. People won't read a big complicated report—keep the entire report as short as possible.
- Having someone that isn't a drinking water expert read the report to see if it makes sense. Also, ask community members for their comments when you send out the CCR.

- ✓ **Consumer Confidence Reports (CCRs) are required annual reports that provide the community with information on their drinking water.** Summary
- ✓ **The CCR should be easy to understand.**
- ✓ **Every customer getting drinking water from the system should receive a CCR either by mail or other ways by July 1 of each year.**
- ✓ **CCRs should include information about the drinking water source, the levels of any detected contaminants, compliance with drinking water rules, and educational information.**

## Notes

[illegible]

## Chapter Ten

# Posting a Public Notice

A public notice is an announcement that something has gone wrong with the water service. Usually this means that your water quality is below standard.

What is a public notice?

The public notice requirement regulations were revised in 2000 to require faster notice in emergencies and fewer notices overall. The revisions should result in notices that better communicate the potential health risks from drinking water violations and how to avoid such risks. Remember that public notices are required in addition to a consumer confidence report (or CCR, see Chapter 9).

You post a public notice because you want to make sure everyone knows there is a problem. While most of your notices will be for minor problems, if you have major problems, the public must be told how to get safe drinking water. If the problem is serious, the notice will warn the village before people get sick.

Why do you post a public notice?

You must notify the people who drink your water if the level of a contaminant in the water is above drinking water regulations; if there is a waterborne disease outbreak or any other situation that may be a health risk; if the water system fails to test its water as required; or if the system has a variance or exemption from the regulations.

State regulations require that you post a notice when your operation violates a drinking water regulation. Since your utility would likely already be in contact

When do you post a public notice?

## Chapter Ten

with them in such a violation situation, you may also want to coordinate with ADEC on these notices. There are three levels of violations that trigger public notice:

**Tier 1 (acute):** exceeding the limits or failure to take confirmation sample for coliform bacteria, nitrate and nitrite, chlorine dioxide, turbidity, waterborne disease outbreak or other waterborne emergency, and turbidity (ADEC determines when a Tier 1 notice is needed). These are situations that may immediately harm public health.

**Tier 1 (non-acute):** exceeding the limits on any other contaminant, monitoring or testing procedure violation, or failing to follow a variance or exemption schedule.

**Tier 2:** failing to follow proper monitoring procedures or any time you are issued a variance or exemption.

**Tier 3:** all other monitoring or testing procedure violations, if operating under a variance or exemption schedule, and special public notices. (Water utilities may choose to include this notice in their annual consumer confidence report.)

Depending on the severity of the situation, water suppliers have from 24 hours to one year to notify their customers of a drinking water problem. See the *Public Notice Requirements* table on page 125.

What should the public notice say?	It should clearly describe the problem, any health risks, what the utility is doing about it, and what people can do to protect themselves. Utilities must address specific points and use certain wording in a public notice, including:
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1. A description of the violation.
2. When the violation occurred.

### Posting a Public Notice

3. Potential health effects.
4. The population at risk (for example, infants, children, elderly).
5. What is being done to fix the problem.
6. Whether other water supplies should be used.
7. Actions that customers should take (for example, boiling).
8. Mandatory language for each chemical problem regarding potential health effects (provided in Alaska Drinking Water Regulations, Mandatory Health Effects Language for Public Notice, 18 AAC 80.1015).
9. The name, phone number, and address for more information.
10. This statement: *“Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.”*

The image shows a sample 'BOIL WATER NOTICE' form. It is a rectangular box with a double-line border. The title 'BOIL WATER NOTICE' is at the top in large, bold, sans-serif capital letters. Below the title, the text reads: 'Samples from [redacted] public water system show that the water may be contaminated.' The next line says: 'This BOIL WATER NOTICE is in effect March 31st until further notice.' Below that, it says: 'Boil water for 2 minutes before drinking.' At the bottom, it provides contact information: 'For more information call the Alaska Department of Environmental Conservation in Fairbanks at 907-555-1212.' The redacted area is a solid black oval.

Example of  
a *Boil Water*  
public notice

## Chapter Ten

Again, ADEC can help you get a proper public notice out. The specific points are listed in the Drinking Water Regulations under 18 AAC 80.1010 (General Content for Public Notice).

Is there more than one way to post a public notice?	<p>The minimum required methods of getting a public notice out to the community include the media, hand delivery or posting for Tier 1 notices and direct mail, hand delivery, or posting for Tier 2 and Tier 3 notices.</p> <p>Therefore, for serious violations (Tier 1 acute), you should set up broadcasts over any radio or television stations that serve the area or hand deliver notices to all your customers. Also, you should place public notices on bulletin boards in public location</p> <p>For less serious violations (Tier 1 non-acute), you should publish notices in local newspapers (daily or weekly) or send them out by mail.</p> <p>All notices must be posted in popular public locations regardless of the seriousness of the infraction. You should make sure any non-English speaking people in your community get the message, too.</p>
How soon after a violation is known do you post notice?	<p>If it is a matter of serious health concern, the notice should go out <i>immediately</i>. Tier 1 acute requires a public notice posting within 24 hours. But in those cases, don't wait at all. <i>Let everyone know as soon as possible</i>. There are some other regulated time frames as indicated on the table opposite.</p>
What are the follow-up requirements?	<p>Water utilities must consult with the state within 24 hours of a Tier 1 violation to receive direction on future requirements. Also, the utility needs to certify to the state within 10 days that it has met all public notice</p>

## Posting a Public Notice

requirements. In some circumstances, you may be required to continually post notices until the hazard is eliminated. If the condition is serious, hand delivered notices must be repeated at least once every three months until the problem is resolved. Even if you are given a variance or exemption, you must continue posting as long as the variance or exemption is in effect.

### Public notice requirements

Class of violation	Posting method	Notice out within	Repeat notice required?
Tier 1 acute □	Radio and/or TV □ Hand delivery □ Post in noticeable □ places	24 hours□	Posting for as long as □ the violation exists or for 10 days, whichever is □ longer.□□
Tier 1 non-acute	Newspaper □ (daily or weekly) □	14 days	None
	Mail or hand □ delivery	45 days	Repeat every three months for □ as long as the violation exists.□□□
	Post in noticeable □ place□□	3 months	Continue to post for as long as □ the violation or failure exists.
Tier 2□	Newspaper (daily or weekly) Mail or hand □ delivery □	12 months	Repeat mail or delivery every □ three months for as long as □ the violation exists.
Tier 3□	CCR, mailing□	12 months□□	None□□

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“Public notice means that the public notices. I mean that’s pretty simple if you live in a city. There’s all kinds of ways to let people know there’s a problem. Out here, quite a few people are not native English readers, so when I have to put out a public notice, I also walk around the village and talk to people. Rumor moves faster than radio waves out here, so I consider talking to people just as important as any piece of paper I stick on a bulletin board.”

## Chapter Ten

- Summary
- ✓ A public notice is an alert to the public when there is a problem with their drinking water.
  - ✓ To notify customers of a drinking water problem, a notice should be posted from 24 hours to one year depending on the health risk. (When a threat to public health exists, get the word out immediately!)
  - ✓ There are three levels, or tiers, of violations that require public notices. Each tier has different time requirements for getting the notice out to the public.
  - ✓ Specific wording is required on a public notice.
  - ✓ Utilities can use several methods to get notices out to the public including posting on bulletin boards, TV and radio, newspapers, hand delivery, and mailing.
  - ✓ Water utilities should notify ADEC of the violation immediately and follow up with the agency and public, as appropriate.



## Notes

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## Chapter Eleven

# Running a Wastewater Disposal Program

Several years ago, a honey bucket waste hauler came home from work and hung his work overalls on a hook in his home. When his son rushed over to give his dad a hug, he brushed up against the overalls. As all kids do, the child later put his fingers into his mouth. Without anyone realizing it, he got hepatitis from the germs on the overalls. But before any symptoms appeared, he went to school and spread the disease to 15 other kids.

A health inspection traced the outbreak back to the overalls. Now people in that village who work with wastewater or honey buckets are much more careful how they handle waste. Workers now change clothes and wash thoroughly before going home. Clothing and equipment are stored in lockers so other people and animals can't accidentally touch them. Spilled sewage is cleaned up immediately.

This true story illustrates the potential for serious sickness if waste is not dealt with properly. No one wants to endanger his or her family's health. Training workers to operate a wastewater system is vitally important for any type or size of system. So is setting up your system correctly to begin with—for instance, sewage lagoons should be well fenced to keep animals out and have signs warning people to stay away.

The regulations change every couple of years or so. (The dates of the regulations this guide was written under are listed in Appendix E.) Make sure you get on ADEC's mailing list for updates and call ADEC every year to double-check that you have the current version.

Where to  
get help on  
regulations

## Chapter Eleven

Often, ADEC has plain English fact sheets or short letters that explain new requirements so when you call ADEC, ask for anything that might be available that helps explain the new regulations. A list of ADEC contacts for wastewater issues is provided in Appendix A.

### To Whom Does this Chapter Apply?

This chapter applies to utility managers and wastewater operators that serve communities of 25 to 1,500 people. It points out the important issues involved in running a wastewater program and urges readers to contact ADEC for more detail. Wastewater systems for Alaskan communities of this size include:

- Community septic tanks attached to drainfields
- Community septic tanks attached to ocean outfalls
- Percolating sewage lagoons (tundra ponds)
- Discharging sewage lagoons (tundra ponds) with discharges to rivers or lakes

***Single family and duplex residences are not covered in this guide.***

If you are the owner or operator of an onsite septic system for a single-family house or duplex this guide is not for you. Contact ADEC for your requirements. Ask for a copy of the ADEC's *Onsite Wastewater Installer's Manual*. If you have an onsite septic system and it isn't performing well, ADEC will likely be able to help.

If local conditions are not good for septic systems, ADEC knows of design improvements and other types of systems that might work in your area.

### Setting Up a Wastewater System

Preapplication conference	Long before your target date for a new or improved wastewater system—before you even start designing
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### Running a Wastewater Disposal Program

or looking for funding for a wastewater system—arrange a meeting with ADEC to discuss your project. This meeting, or preapplication conference, is not required, but is recommended to:

- Discuss your wastewater problems
- Brainstorm possible solutions
- Learn who to call at ADEC for help
- Discuss potential funding sources
- Identify permit requirements
- Review the plan approval process
- Identify plan review fees
- Get a completeness checklist

Wastewater system maintenance should be a routine part of your wastewater treatment program. If your system serves more than 500 people, you are required to have a certified wastewater operator. See Chapter 4, *Operator Certification and Training*, for details.

System  
maintenance  
and certified  
operators

Before you build or improve a community wastewater system, you must get your plans approved by ADEC. Plans apply to the physical building and *construction* of the system. No construction can begin until the plans are reviewed and signed off by ADEC staff. Local building or construction permits may also be required. The plan approval process involves several steps. These steps are shown on the chart on page 133.

Plan approvals

ADEC has a plan approval application package that includes plan approval forms and design criteria. In 2002, ADEC started charging a plan approval fee that must be paid when you send in your application package. (Contact the Division of Air and Water Quality to determine fee amount.) A registered engineer must sign the plans before they are submitted to ADEC, and no construction can begin until ADEC has signed off

## Chapter Eleven

on the plans. It may take a while for ADEC engineers to review and sign off on the plans, so include plenty of time in your schedule to prepare information and get approval from ADEC.

Plans for your system will include operating procedures and contingency plans, such as:

- A sewage solids disposal plan and provisions to prevent clogging
- A routine maintenance program
- Provisions for funding to keep the program going at all times
- A plan for cleaning up spilled sewage

Viral meningitis, caused by improperly handling sewage and wastewater, is a serious illness. It is very painful and can be fatal if left untreated.

Contact ADEC Wastewater Program staff for a copy of sewage spill cleanup recommendations. Sewage spills or overflows are a health hazard and must be cleaned up immediately according to a plan developed ahead of time.

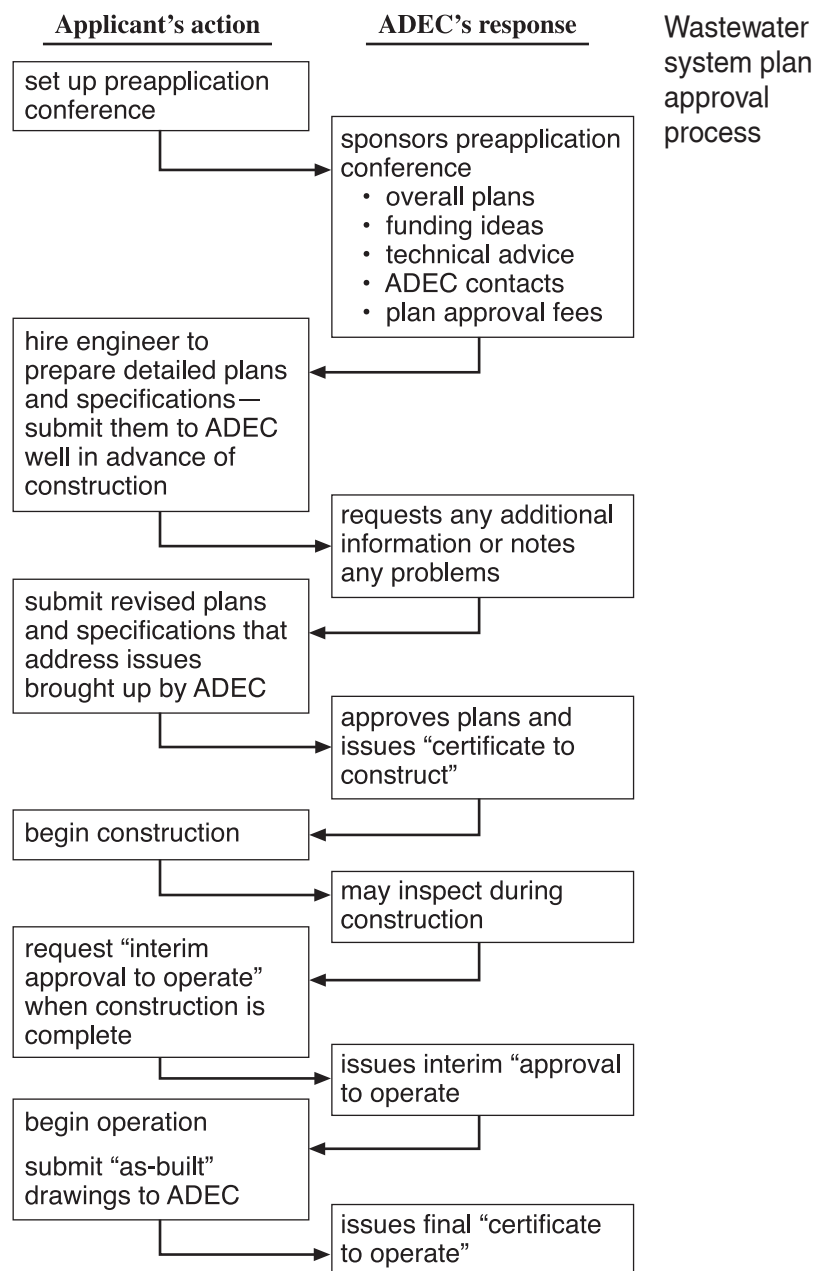
### Permits

Your wastewater permit sets the **operating conditions** of your system. One example of the importance of permitting is the protection of beaches certified for clamming or shellfish harvesting. If ADEC knows ahead of time that a wastewater system may discharge near a certified beach, extra treatment requirements may be added to the conditions of the permit to protect those beaches.

Permits apply to the *operation* of a wastewater system. For example, permits often include:

- Test requirements
- Report requirements
- Flow measurements
- Operating restrictions

## Running a Wastewater Disposal Program



## Chapter Eleven

A “general permit” may be issued to a utility using a common method generally used by many systems for discharging wastewater. General permits are usually easier to get than individual permits.

Try to find out as early as possible which permits are required for your project. Contact your local ADEC office for help. Your preapplication conference with ADEC, discussed early in this section, is a good place to nail down which permits you will need. You will need a permit to discharge sewage into a river, lake, or even the ocean. These permits benefit you since no one wants to pollute the river or bay they depend on. ADEC has the technical expertise to make certain that your plans do not unexpectedly cause problems. The permit will assure that the water body can handle the waste after treatment. Federal law requires a high level of treatment before discharging wastewater into rivers and lakes and usually a lower level of treatment for discharging into the ocean. ADEC meshes these federal laws with any state or local requirements and will advise you how much treatment is required when you submit your wastewater system plans.

Septic tank and sewage lagoon systems that let sewage soak into the ground rather than flow into a water body may require land disposal permits. The ADEC Division of Air and Water Quality Water Discharge Permits and Certification Program is responsible for issuing wastewater treatment and land disposal permits.

Permits are not plan approvals

The permit process is different from the plan approval process and sometimes takes longer. Permit applications need to be filled out and any permit fees paid. Don’t assume that a person that approves wastewater *plans* within ADEC will also be the *permit* writer. Here are some permits that are required for various situations:

- Permit to discharge wastewater into rivers, lakes, or the ocean
- Permit to discharge wastewater to a percolating sewage lagoon (tundra pond)
- Permit to discharge sewage solids onto land



### Running a Wastewater Disposal Program

- Permit to discharge filter backwash (nondomestic water discharge)
- Permit to burn sewage solids

For small wastewater systems, ADEC usually issues general permits that cover similar types of systems. For example, one general permit is the permit for wastewater lagoons used by fewer than 1,000 people. Another general permit applies to septic tanks that discharge through ocean outfalls. °

For larger wastewater systems, the federal EPA issues permits (called National Pollutant Discharge Elimination System or NPDES permits). ADEC is still involved, though, because they are required to review the NPDES permit, add additional requirements for local considerations, and finally, certify the permit before the system may be operated.

Next we'll examine more closely some of the various systems used in Alaska.

An “**Individual permit**” is a custom permit written to meet the specific needs and requirements of the utility in the location where it is taking place. Individual permits can be more difficult to get.

### Common Wastewater Systems in Alaska

If you use a septic tank attached to a drainfield, soil tests must be done before the system is installed to be sure the water will percolate without contaminating nearby groundwater or surface water. If your soil is frozen most of the year or your soils contain silt and

Septic systems

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“Sometimes avoiding a health disaster is as simple as looking at the big picture. I’ve seen some villages where they just dump their honey buckets out on the beach. The sewage goes out with the tide, and, you got it, it comes back in with the next one. Sometimes people are drying fish in the area. Then you get flies that feed on the sewage and then land on the salmon. That’s not good for anyone’s health.”

## Chapter Eleven

clay, you may not be able to install a septic system with a perforated pipe drainfield. As a rule, your septic system needs to sit at least 4 feet above the water table and at least 6 feet above impermeable materials such as bedrock, clay, or permafrost. The system must also maintain a minimum separation distance from drinking water wells or other drinking water sources. (See the *Separation distances for sewage lagoons and septic tanks* table, page 139.) A good source of information for septic system design is the ADEC *Onsite Wastewater Installer's Manual*.

For your health and safety, you should inspect your septic system at least once a year. Pump out the solids (also called fecal solids or biosolids) on a routine schedule and dispose of them properly.

Chemical additives	Companies will often try to sell additives to unsuspecting septic tank owners—chemicals that are supposed to make the system work better. In the opinion of most Alaskan wastewater specialists, chemicals are not necessary and may even be harmful to the natural bacteria that treat the water in the septic tank. Enzymes that may work well in warmer climates tend not to work well in Alaska septic systems. Some added chemicals might leach out of the system and contaminate groundwater. Avoid use of chemicals in septic tanks without contacting ADEC first.
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Septic tanks with ocean outfalls	If your wastewater is disposed of in a septic tank that discharges to the ocean, tests may be required to make sure your discharge doesn't negatively affect the water. ADEC issues permits for septic tanks with ocean outfalls. However, because of new clean water rules, these permits are becoming more difficult to get approved. These permits must be obtained before a septic tank and outfall are installed and must be renewed every five years.
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### Running a Wastewater Disposal Program

If your wastewater is disposed of in a percolating lagoon, no wastewater is pumped out; it just soaks into the ground. The slow percolation of wastewater through soil provides some treatment before the wastewater reaches the groundwater table. Tests may be required to make sure the groundwater is not being contaminated. If solids in the bottom of the lagoon prevent proper percolation and threaten a lagoon overflow, the solids must be removed and disposed of safely.

Percolating  
lagoons

If your wastewater is disposed of in a lagoon that discharges to a water body, all discharges need to comply with permit requirements. Tests may be required before and during your lagoon discharge. These tests make sure the waste discharge can be mixed with the water body without endangering the people or animals that use it. ADEC issues general permits for lagoons that serve 1,000 or fewer people. The permit must be obtained before a lagoon is built and must be renewed every five years. Discharge limits are written into the permit; however, these limits may be waived. In some permits, a “notice of disposal” must be approved by ADEC before wastewater may be discharged.

Discharging  
lagoons

### Operating a Wastewater System

There are several ways small utilities can properly dispose of sewage solids. For further detail, call your local ADEC Wastewater Program and Solid Waste Program contacts listed in Appendix A. When the sewage solids are still mostly liquid (less than 5 percent solids), contact the ADEC Wastewater Program for management details. When the sewage solids are drier (greater than 5 to 10 percent solids) contact the ADEC Solid Waste Program for proper disposal information.

Sewage solids

## Chapter Eleven

Sewage solids in small Alaskan communities are typically handled in the following ways:

Honey bucket  
haul systems  
should be  
cleaned  
regularly.

- Hauled by the honey bucket collector to the sewage lagoon
- Hauled by citizens to the sewage lagoon
- Hauled by a pumper truck to the sewage lagoon
- Hauled to a Class III Municipal Solid Waste Landfill where they can be disposed in trenches under certain conditions

The ADEC Solid Waste Program allows disposal of septic tank solids and wastewater treatment sludge in trenches at the landfill if these rules are followed:

- Fill only one trench at a time
- Make sure the trench is not more than 4 feet wide and 12 feet deep
- Make sure the bottom of the trench is at least 6 feet higher than the water table
- Add dry hydrated lime or quicklime to the waste so that a pH of 12 (waste gets very hot under this condition) is maintained for at least 30 minutes
- Make sure the waste is covered with at least 6 inches of soil after being placed in the trench

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“We have a lot of dogs in the village, and every once in a while one of them will get loose. Once a dog fell into the sewage lagoon, then ran all over town trying to shake itself dry. Right after I saw that, I locked up the gate to the sewage lagoon and repaired all of the holes in the fence. I can’t say that I’ve bettered the health of the village, but I’ve gotten rid of one more potentially bad situation.”

## Separation Distances

Alaska drinking water regulations require that septic tank and sewage lagoon wastewater systems be kept certain minimum distances away from drinking water sources, treatment, and piping systems. These separation distances are listed in ADEC regulations and guidance documents and are summarized below and in the table on page 33.

Minimum separation distances		
	Sewage lagoons	Septic tanks
<b>200 ft from:</b>	Drinking water wells	Drinking water wells
<b>100 ft. from:</b>	river, lake, stream, spring	river, lake, stream, spring
<b>50 ft. from:</b>	slopes >25%	
<b>10 ft. from:</b>	lot line <sup>a</sup> , building foundations	lot line <sup>a</sup> , building foundations, sewage lagoon, other
<b>6 ft. from:</b>	bedrock, clay	
<b>4 ft. from:</b>	ground surface (ground cover) <sup>b</sup> seasonal high water table	ground surface (ground cover) <sup>b</sup>
<b>2 x gravel depth or 6 ft, whichever is greater, from:</b>	other sewage lagoons	

Separation distances for sewage lagoons and septic tanks

<sup>a</sup> Recommended

<sup>b</sup> Southwest Alaska (Kodiak and southwest of Chignik) = 2 feet; Southeast Alaska and Valdez = 3 feet; All remaining areas of the state = 4 feet. See 18 AAC 72.035, Table A.

## Water Quality Standards

As stated above, wastewater must be treated before it can be discharged into a river, lake, or the ocean. There are very strict rules about water quality in a river, lake, or ocean. These rules, called the Alaska Water Quality Standards, are designed to protect the many types of water users and the different types of water. (Freshwater standards are sometimes a little different than saltwater standards.) Water users include humans who may drink

## Chapter Eleven

the water, fish and other organisms that live in the water, and ecologically sensitive land areas, such as wetlands.

Water quality standards are also designed to protect recreational users such as fishermen, swimmers, and boaters whose skin may come in contact with water. It may seem surprising, but water quality standards for fish and other animal life are usually stricter than water quality standards for drinking water. Fish and other water organisms are sometimes more sensitive to small pollution concentrations than humans are—they *live* in the water after all.

- Summary
- ✓ **There is potential for serious sickness if waste is not dealt with properly.**
  - ✓ **A preapplication conference with ADEC can be very helpful in planning your wastewater system.**
  - ✓ **ADEC must approve all plans for new or modified sewage systems.**
  - ✓ **Besides approval of plans, one or more permits could be required before the system can operate.**
  - ✓ **If your system serves more than 500 people or 100 or more connections, it must have a certified wastewater operator.**
  - ✓ **Removing sewage solids and performing other regular maintenance are vital in keeping your system operating properly.**
  - ✓ **Septic tank and sewage lagoon wastewater systems must be kept certain minimum distances away from drinking water sources, treatment, and piping systems.**
  - ✓ **The Alaska Water Quality Standards exist to protect waterways from degradation.**

## Notes

[illegible]

## Notes

[illegible]



# Acronyms and Abbreviations

<b>AAC</b>	Alaska Administrative Code
<b>ADEC</b>	Alaska Department of Environmental Conservation
<b>ANTHC</b>	Alaska Native Tribal Health Consortium
<b>As</b>	Arsenic
<b>ATTAC</b>	Alaska Training and Technical Assistance Center
<b>Ba</b>	Barium
<b>Be</b>	Beryllium
<b>CCR</b>	Consumer Confidence Report
<b>Cd</b>	Cadmium
<b>CEU</b>	Continuing Education Unit
<b>Cl</b>	Chlorine
<b>Cn</b>	Cyanide
<b>Cr</b>	Chromium
<b>Cu</b>	Copper
<b>DCED</b>	Department of Community and Economic Development
<b>D/DBPs</b>	Disinfectants and Disinfection By-Products
<b>D/DBPR</b>	Disinfectants and Disinfection By-Products Rule
<b>DRC</b>	Direct Responsible Charge
<b>EPA</b>	Environmental Protection Agency
<b>F</b>	Fluoride
<b>gpd</b>	gallons per day
<b>GWUDISW</b>	Groundwater Under the Direct Influence of Surface Water
<b>Hg</b>	Mercury
<b>HC</b>	Hypochlorite (chlorine in liquid form)
<b>HPC</b>	Heterotrophic Plate Count
<b>HTH</b>	chlorine in powder form
<b>IOC</b>	Inorganic Chemical or Inorganic Compound
<b>LMI</b>	brand name for a type of pump used to add chemicals to water

### Acronyms and Abbreviations

<b>MCL</b>	Maximum Contaminant Level
<b>MSWLF</b>	Municipal Solid Waste Landfill
<b>mg/l</b>	milligrams per liter (same as parts per million)
<b>ml or mL</b>	milliliter. 1000 ml = 1 liter. 100 ml = about 5 fluid ounces
<b>Ni</b>	Nickel
<b>NO<sub>2</sub></b>	Nitrite
<b>NO<sub>3</sub></b>	Nitrate
<b>NPDES</b>	National Pollutant Discharge Elimination System
<b>NTU</b>	Nephelometric Turbidity Units
<b>OIT</b>	Operator-in-Training
<b>Pb</b>	Lead
<b>Pb/Cu</b>	Lead and Copper
<b>PCB</b>	Polychlorinated Biphenyl
<b>pCi/l</b>	pico Curies per liter (radioactivity unit of measure)
<b>PERC</b>	Perchloroethylene (also known as tetrachloroethylene), a VOC found in dry cleaning and solvent degreasing operations
<b>PWS</b>	Public Water System
<b>RMW</b>	Remote Maintenance Worker
<b>RUBA</b>	Rural Utility Business Advisor
<b>Sb</b>	Antimony
<b>Se</b>	Selenium
<b>SO<sub>4</sub></b>	Sulfate
<b>SOC</b>	Synthetic Organic Chemical or Synthetic Organic Compound
<b>SS</b>	Suspended Solids
<b>SWTR</b>	Surface Water Treatment Rule
<b>TCR</b>	Total Coliform Rule
<b>TFE</b>	Trifluoroethylene
<b>Tl</b>	Thallium
<b>TSS</b>	Total Suspended Solids
<b>VOA</b>	Volatile Organic Analysis
<b>VOC</b>	Volatile Organic Chemical or Volatile Organic Compound
<b>WT OIT</b>	Water Treatment Operator in Training

# Glossary of Terms

Term used in the lead/copper rule. An action level is a concentration of lead or copper in a drinking water supply that is just high enough to cause concern and trigger further action toward reducing the concentration.	<b>action level</b>
Water flowing from a potential contamination source in to a potable water system (drinking water system). Backflow prevention devices are required on all drinking water systems at points where potential contamination could occur. Backflow prevention devices include check valves or anti-siphon valves.	<b>backflow</b>
Microbiological contaminants found in drinking water (coliform is a type of bacteria which concerns drinking water).	<b>bacteria</b>
A shorthand term for bacteria (usually in reference to coliform bacteria).	<b>“bacti”</b>
A disease, also called Giardiasis, caused by the parasite <i>Giardia lamblia</i> , a drinking water microbiological contaminant.	<b>beaver fever</b>
Solids removed from domestic wastewater, also called sludge. Biosolids are regulated by the federal Clean Water Act under the Part 503 regulations.	<b>biosolids</b>
A community or utility’s ability to operate and maintain a water or wastewater utility. Capacity is not only operating a system but managing and financing, too.	<b>Capacity</b>
A public drinking water supply system that serves 25 or more residents for at least six months per year or 15 or more residential service connections for an entire year.	<b>Class A public water system</b>
A public drinking water supply system that serves 25 or more residents for at least 60 days during a year.	<b>Class B public water system</b>

## Glossary of Terms

<b>cleanouts</b>	Hard to reach places in wastewater systems where operators can get into the system to clean it out. Cleanouts are required on septic tank chambers and in sewage pipelines.
<b>“coli”</b>	A short term for coliform.
<b>coliform</b>	A type of bacteria often found in untreated water (especially surface water). Some forms, such as <i>E. Coli</i> and fecal, are quite harmful.
<b>compliance point</b>	A sample location in a water or wastewater system where the water collected from that location is tested and compared to environmental regulations for compliance purposes. For example, a sewage lagoon outfall is the compliance point for collecting a wastewater sample and comparing the results to permit limits.
<b>composite sample</b>	A sample consisting of up to five individual samples combined into one. Composite samples are allowed for some drinking water systems as a way to save money on expensive laboratory tests. Certified laboratories composite the sample before testing.
<b>confirmation sampling</b>	When a drinking water sample is out of compliance, a second sample is collected as soon as possible in the same place as the first sample as a double-check on the accuracy of the first noncompliant sample. The second or subsequent sample is called a “confirmation sample.”
<b>Consumer Confidence Report (CCR)</b>	Yearly reports that water utilities are required to write and distribute to customers that include information on any substances that have been found in drinking water and whether the water is safe to drink.
<b>contaminant</b>	Any physical, chemical, biological, or radiological material in water which, in sufficient quantity, makes it unsafe for human consumption.
<b>corrosivity</b>	A measure of the corrosive nature of a water supply such as the tendency for water to oxidize the insides of pipes. Corrosive water may leach metals from water pipes causing lead or copper concentrations to be unsafe in drinking water supplies.
<b>cross connection</b>	Any direct or indirect connection between a water supply and a potential or actual source of contamination. For

## Glossary of Terms

example, a connection between a sewer, drain, storage reservoir, fire fighting water, or boiler water system and a water supply is considered a cross connection.

A microbiological contaminant in drinking water supplies that is extremely resistant to treatment and can cause death and sickness if not removed from a contaminated water supply. Filtration is required to remove *cryptosporidium* since disinfection is not effective against it.

***Cryptosporidium***

A collapsible, plastic water sample container shaped like a cube when full.

**cubitainer**

The chlorine (or other disinfectant) concentration remaining in a water piping system after a chlorine (or other disinfectant) dose is applied at the treatment plant.

**disinfectant  
residual**

A chemical treatment process used to kill or inactivate microbiological contamination in drinking water supplies. Examples of disinfectants are chlorine, ozone, and chloramines.

**disinfection**

The piping system used to carry treated water to customers.

**distribution  
system**

A set of perforated underground pipes installed in shallow gravel trenches and used to disperse septic tank treated wastewater to surrounding soil (also referred to as a leach field).

**drainfield**

Bacteria that can cause severe health problems if consumed in a drinking water supply.

***E. coli***

Bacteria that can cause severe health problems if consumed in a drinking water supply.

**fecal coliform**

A treatment process to remove particles, including microorganisms, from water or wastewater.

**filtration**

A treated water sample (also referred to as a polished water sample).

**finished water  
sample**

A sample technique required for the lead/copper drinking water rule. A first draw sample is one that is collected from a sample location only after the water in the pipes has been sitting still for at least 6 hours. For example, a family that is supposed to collect a lead/copper sample from their kitchen

**first draw sample**

## Glossary of Terms

water faucet has to make sure no one in the house uses any water for at least six hours before they collect the sample. Unlike other water sample techniques, the water is not supposed to be run for a few minutes before the sample is collected. A first draw sample has to be the first drop out of the faucet after the required 6 hour waiting period.

<i>Giardia</i>	A drinking water microbiological contaminant that causes the disease Giardiasis.
<b>grandfather samples</b>	Water samples that were collected before a regulation existed but are allowed to be used to comply with a new regulation. Specific rules apply.
<b>groundwater</b>	Water beneath the surface of the ground.
<b>groundwater under the direct influence of surface water (GWUDISW)</b>	GWUDISW exists where there is a mixing of groundwater and surface water. Surface water sources could allow water to seep down to the water table from which you draw your drinking water. Thus your groundwater well water could be affected by the water quality of the surface water.
<b>honey bucket</b>	A bucket (usually five gallons) used for in-home sewage collection in rural Alaska. Honey buckets may be lined with plastic garbage sacks. Honey buckets are emptied into a large honey bucket wagon, holding tank, disposal lagoon, or onto a beach by individuals or wastewater operators.
<b>hydrated lime</b>	A common water treatment chemical manufactured from limestone. The chemical formula is $\text{Ca}(\text{OH})_2$ .
Hypochlorite (HC)	Chlorine in liquid form.
HTH	Chlorine in powder form.
<b>initial sampling</b>	The very first sample you send to a laboratory when you open your utility for business. This initial sample will serve as your testing benchmark. Initial sampling is usually four quarters of sampling or two six-month consecutive sets of samples.
<b>inorganic chemicals or inorganic compounds, inorganics (IOCs)</b>	Chemicals that do not have carbon or oxygen in their chemical composition. IOCs are regulated contaminants with respect to drinking water. Most of these chemicals are minerals or metals.

## Glossary of Terms

A sample that cannot be used for compliance purposes because it has been contaminated or mishandled. Examples include arriving at the laboratory too late to make the holding time or having the sample bottles break in the airplane on the way to the laboratory.	<b>invalid sample</b>
See drainfield.	<b>leach field</b>
A liquid measure of volume equal to about one quart.	<b>liter</b>
brand name for a type of pump used to add chemicals to water	<b>LMI</b>
A daily record of water test data.	<b>logsheet</b>
The maximum level of contaminant that is allowed to exist in your water and still be consumed by humans without harmful health effects.	<b>maximum contaminant level (MCL)</b>
A condition caused by drinking water with high in nitrate concentrations. It robs oxygen from the blood stream and is seriously harmful to infants.	<b>methemo- globinemia</b>
A unit of chemical concentration. Equivalent to parts per million (ppm).	<b>milligrams per liter</b>
A measure of liquid volume. 1000 ml = 1 liter. 100 ml = about 5 fluid ounces.	<b>Milliliter (ml or mL)</b>
A general term referring to the sampling, testing, and reporting of water supplies or wastewater discharges.	<b>monitoring</b>
A one page summary of drinking water monitoring requirements unique to each public water system. ADEC prepares these and sends them to each PWS.	<b>monitoring summary</b>
Unit used to measure turbidity in water.	<b>nephelometric turbidity unit (NTU)</b>
A wastewater permit issued by the U.S. Environmental Protection Agency.	<b>National Pollutant Discharge Elimination System (NPDES)</b>
Chemicals that have carbon in their composition. Organics are regulated contaminants in the drinking water regulations. See <b>volatile organic chemicals</b> and <b>synthetic organic chemicals</b> .	<b>organics</b>

## Glossary of Terms

<b>outfall</b>	Where wastewater leaves a piping system. An outfall is usually the end of a pipe, but can also be the end of a water channel where it dumps into river, lake, or ocean.
<b>pCi/l</b>	pico Curies per liter (radioactivity unit of measure)
<b>Perchloroethylene (PERC)</b>	a VOC found in dry cleaning and solvent degreasing operations (also known as tetrachloroethylene).
<b>polychlorinated biphenyl (PCB)</b>	A chemical formerly used in electrical equipment such as transformers. PCB is a regulated drinking water contaminant under the SOC's rule.
<b>percolating sewage lagoon</b>	A wastewater treatment system used in rural Alaska. See also "sewage lagoon" in this glossary. A percolating sewage lagoon does not have a discharge pipe. Rather, water seeps into the ground from the bottom surface area of the lagoon.
<b>plan approval</b>	ADEC requirement for any new or modified work on a water or wastewater system. Construction may not begin until ADEC completes the plan approval process.
<b>potable water</b>	Water of drinking quality.
<b>preapplication conference</b>	A meeting between community representatives and ADEC to discuss all aspects of new construction or modifications of water or wastewater systems. The preapplication conference is the recommended first step in the ADEC plan approval process.
<b>protozoa</b>	Small, one-celled microorganisms that can be the cause of several waterborne diseases, such as amoebic dysentery, giardiasis, and cryptosporidiosis.
<b>public water system identification number (PWSID)</b>	This is your water utility identification number and license number by which you are legally allowed to do business. This number is very important to put on laboratory chain of custody or purchase order paperwork. This number should always be included on written correspondence with government agencies, such as monthly reports, sanitary surveys, and compliance test results.
<b>quicklime</b>	A common water treatment chemical manufactured from limestone. The chemical formula is CaO.



## Glossary of Terms

Drinking water contaminants that may cause cancer in humans and are regulated under the drinking water radionuclide rule. An example of a regulated radionuclide is gross alpha radiation. Radioactivity occurs in nature and also in industrial weapons and power supply operations.	<b>radionuclides</b>
Water taken directly from a water source, i.e., untreated water.	<b>raw water</b>
A professional engineer registered in Alaska.	<b>registered engineer</b>
A second sample or set of samples sent to the laboratory because the first sample or samples ( <b>routine samples</b> ) could not be tested accurately or showed noncompliance with MCLs. A double-check to rule out false positive tests. This term is usually used with regard to total coliform sampling.	<b>repeat sample</b>
The normal, scheduled water sample you take to test your water quality. This term is usually used with regard to total coliform sampling.	<b>routine sample</b>
The labels on the samples which show exactly who took the sample, when, from where, on what date, and at what time. All of these details are important so that the laboratory can make a quality assessment of your samples.	<b>sample labeling</b>
Exactly where in the water or wastewater utility you take your samples.	<b>sample point</b>
How often you take water samples. This will vary depending on which test the laboratory will be doing.	<b>sampling frequency</b>
A report prepared by a registered engineer, sanitarian, or qualified individual who inspects and evaluates a drinking water system's potential contamination sources, water sources, treatment processes, distribution system, and overall operation. The report is submitted to ADEC to assist ADEC in determining drinking water system compliance with the regulations.	<b>sanitary survey</b>
Minimum recommended distances listed in the drinking water and wastewater regulations that make sure contamination sources are far away from drinking water sources and systems during new construction.	<b>separation distances</b>

## Glossary of Terms

<b>septic tank</b>	A wastewater treatment system that consists of a holding tank (usually underground) where sewage solids can settle out of wastewater and the partially treated wastewater can gravity flow (or be pumped) out of the tank to a drainfield or ocean outfall where the wastewater is further treated by micro-biological action.
<b>service connection</b>	A piping connection in a water system that leads from a main pipeline to the curb or property line of a customer, such as a single family home, a community center, or a school.
<b>sewage lagoon</b>	A wastewater treatment system commonly used in rural Alaska. Also referred to as a tundra pond. Lagoons may be lined or unlined, mechanically aerated, passively aerated (no equipment), and constructed above ground or partially below ground. Some lagoons have discharge pipes for discharging treated water to lakes, rivers, or the ocean. Some lagoons do not have discharge pipes and the water in these lagoons seeps into the ground over time (see percolating sewage lagoon).
<b>synthetic organic chemicals (SOCs) or synthetic organic compounds (nonvolatile)</b>	A list of specific chemicals regulated under the drinking water SOC program. Most of these chemicals are pesticides and PCBs.
<b>special purpose sample</b>	A water sample that is needed for a new, specific purpose. For example, suppose that it is discovered that the military had used a special chemical on a now-abandoned base near your village. ADEC may want to test to see if any of that chemical exists in your well water. A special purpose sample would be drawn and the water tested once. If the laboratory test came back non-detect, you would likely not be required to test further.
<b>spectrophotometer</b>	A lab instrument used to measure turbidity using principles of light.
<b>suspended solids (SS)</b>	Particles in water or wastewater that can cause harm to aquatic life or cause taste problems in drinking water.

## Glossary of Terms

A water source such as a lake, stream, river, or pond that is open to the atmosphere and is subject to surface water runoff. Surface water sources are regulated a specific way under the drinking water surface water treatment rule.	<b>surface water</b>
A federal regulation adopted by ADEC that regulates the monitoring, treatment, and reporting for drinking water systems using surface water sources.	<b>surface water treatment rule (SWTR)</b>
A federal regulation adopted by ADEC to monitor and control the amount of coliform bacteria in drinking water.	<b>total coliform rule (TCR)</b>
See suspended solids.	<b>total suspended solids (TSS)</b>
See sewage lagoon or percolating sewage lagoon.	<b>tundra pond</b>
A measure of the amount of solids in water. High turbidity may cause water to look cloudy or dirty.	<b>turbidity</b>
A corridor, usually constructed above ground in rural Alaska, in which thermally insulated water pipes are routed from water source tanks and treatment processes to homes and businesses. Wastewater pipes are also routed in utilidors from homes and businesses to wastewater treatment processes.	<b>utilidor</b>
A test used to determine the concentration of a volatile organic chemical in water.	<b>volatile organic analysis (VOA)</b>
A carbon-based chemical that escapes easily from water into the air. VOCs are regulated under the drinking water regulations. An example of a VOC is benzene.	<b>volatile organic chemical or volatile organic compound (VOC)</b>
A community building common in rural Alaska where showers, laundry facilities, drinking water, and sometimes saunas are available.	<b>washeteria</b>
A hole, shaft, or excavation from which water can be pumped.	<b>well</b>

## Notes

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

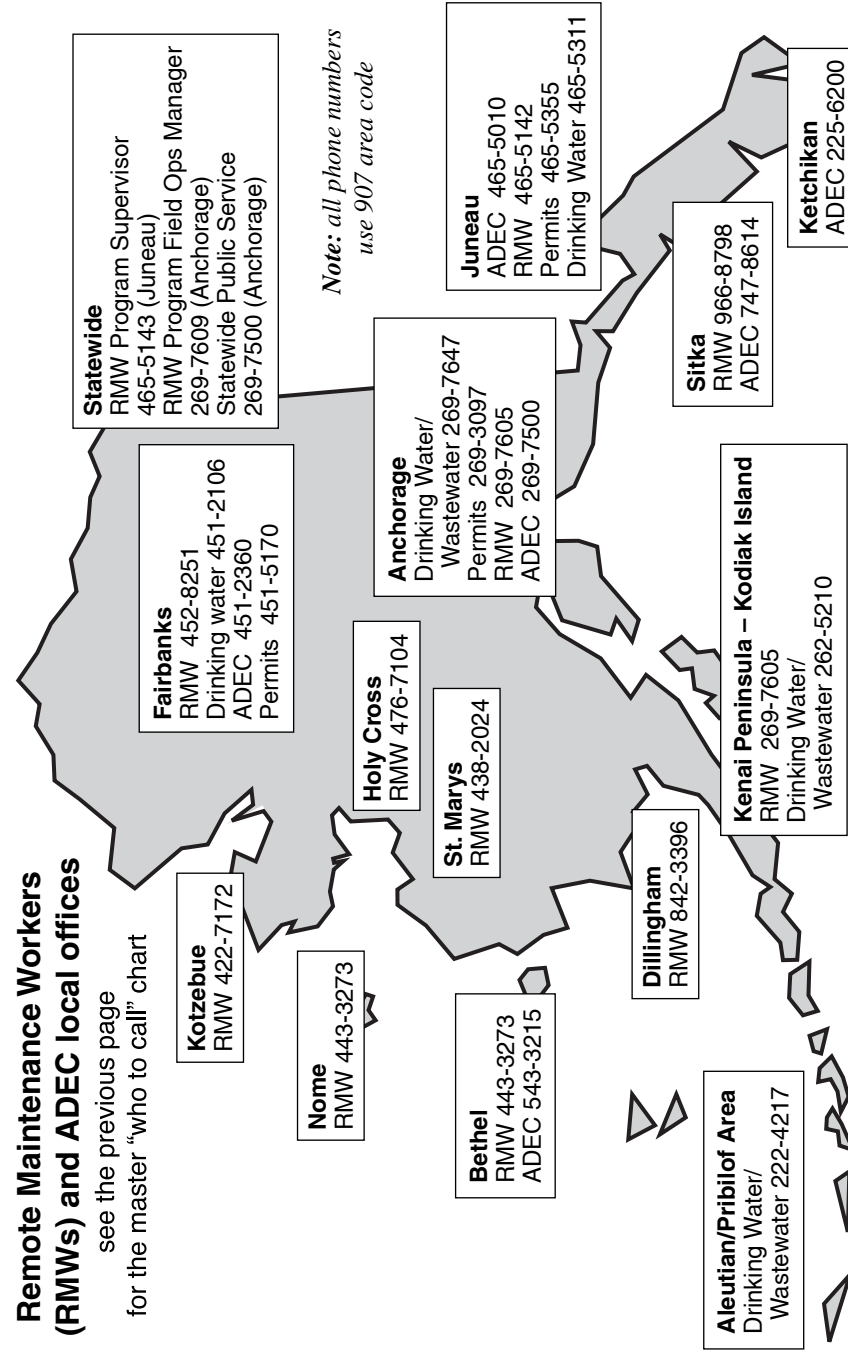
## Appendix A

# Who to Call for Help

<b>For:</b>	<b>Call:</b>	<b>At:</b>
building or updating facilities	ADEC Drinking Water or Wastewater Plan Approval Staff	269-7517 (Anchorage) 451-2108 (Fairbanks) 465-5311 (Juneau) 543-3215 (Bethel)
help with repairs or routine maintenance	the nearest RMW	see map on next page
help with testing procedures	a certified lab or ADEC Drinking Water Program	see Appendix D (labs) and map on next page
questions on laws and regulations	ADEC Environmental Health	see map on next page 269-7653 (Anchorage) 451-2106 (Fairbanks) 465-5311 (Juneau) 543-3215 (Bethel)
health and safety concerns	regional health corporation, local nurse or health aide, Sanitarian	use your local phone book
information on training or operator certification	Facility Construction & Operation	465-5140
help with drinking water and wastewater systems	ADEC Drinking Water and Wastewater Program	269-7647
help with permits	Statewide Public Service	1-800-510-ADEC (2332)
help with business or financial issues and capacity development	RUBA	269-4569

*Note: all phone numbers are 907 area code.*

**Remote Maintenance Workers  
(RMWs) and ADEC local offices**  
see the previous page  
for the master “who to call” chart



## Appendix B

# Information Sources

### **Alaska Department of Environmental Conservation (ADEC)**

555 Cordova Street, Anchorage, 99501

<http://www.state.ak.us/dec/home.htm>

*Numerous divisions within ADEC regulate and provide technical assistance to rural water and wastewater systems. Here are the most commonly called ones:*

- **Operations Assistance & Lending Library**

465-5143 Juneau

[http://www.state.ak.us/dec/dfco/dec\\_dfco.htm#Operations](http://www.state.ak.us/dec/dfco/dec_dfco.htm#Operations)

Provides technical and training information on small utility water and wastewater treatment, distribution, and collection. Videos, posters, pocket guides for sampling, training manuals, and certified operator study guides are available for free or a nominal fee. Some items are loaned out. Also publishes the twice-yearly calendar of training classes, exams, and conferences (which is available through the web site above).

- **Water and Wastewater Program**

269-7647 Anchorage

<http://www.state.ak.us/dec/deh/water/home.htm>

Ensures public water systems provide safe water, and that domestic wastewater systems, public and private, safely and effectively treat and dispose of wastewater. Ensures that suppliers test drinking water as required for regulated contaminants.

State of Alaska

*Note: use 907 area code with phone numbers unless otherwise indicated*

*See Appendix E for sources for regulations.*

## Appendix B

Reviews contaminant monitoring test results from public water suppliers and specifies corrective measures where contamination is indicated. Approves new public water and wastewater systems and modifications to existing ones, and provides design assistance and training for certified installers of on-lot septic systems. Regulates minimum health standards and procedures for design, construction and operation of Alaska's 1,700 class "A" and "B" public drinking water systems. Implements a rural drinking water compliance strategy to assist rural Alaska water systems in providing cost-effective safe drinking water. Provides information about contaminant monitoring and sampling procedures for public water systems and/or private wells. Responds to complaints of contaminated or damaged drinking water wells and impacted watersheds. Maintains a statewide database with monitoring, compliance, and enforcement information on public drinking water systems. Responds to confirmed waterborne disease outbreaks, incidents of illness and overflowing sewage systems. Provides workshops on wellhead protection and source water assessments for communities and public water systems.

- **Village Safe Water Program**

465-5137 Juneau

[http://www.state.ak.us/dec/dfco/fco\\_vsw.htm](http://www.state.ak.us/dec/dfco/fco_vsw.htm)

Secures federal grant funds with state matching funds. Provides grants to small communities for water, sewerage and solid waste studies and projects. Assigns an engineer to each project to assist communities with planning facility design options and addressing regulatory issues. Ensures appropriate and effective use of grant funds by disbursing funds to communities as progress payments after review of invoices.



## Information Sources

### **Department of Community and Economic Development**

#### **Rural Utility Business Advisor (RUBA) Program**

550 West 7th Avenue, Suite 1640

Anchorage, AK 99501

269-4569 Anchorage

<http://www.dced.state.ak.us/cbd/ruba/ruba.htm>

Provides assistance to small rural communities state-wide that are preparing to receive new or upgraded sanitation systems and assesses a community's ability to provide management and administration of sanitation utilities. Tracks efforts to bring communities up to an acceptable management performance standards. Continued RUBA assistance to these communities depends on the community meeting a baseline level of progress towards improvement.

### **U.S. Environmental Protection Agency**

Anchorage Office

222 West 7th Avenue #19

Anchorage, AK 99513-7588

271-5083 Anchorage

U.S.

Government

### **Region 10 Drinking Water Unit**

1200 Sixth Avenue, Seattle, WA 98101

(206) 553-1893 Seattle

<http://yosemite.epa.gov/R10/WATER.NSF>

Protecting public health of Northwest communities by working with states, municipal water suppliers, tribes, and others to ensure that all public water systems provide safe drinking water.

## **Appendix B**

Other **Alaska Native Tribal Health Consortium (ANTHC)**  
**Department of Health and Engineering**  
4141 Ambassador Drive, Anchorage, AK 99508  
729-1900 Anchorage

[http://www.anthc.org/Environmental\\_Health.htm](http://www.anthc.org/Environmental_Health.htm)

Working in partnership with Native communities, provides a comprehensive array of public health-based services statewide including sanitation facility planning, design, and construction, and water and sewer system operation and maintenance assistance.

### **Alaska Training and Technical Assistance Center (ATTAC)**

1332 Seward Avenue, Sitka, AK 99835  
Toll Free (888) 750-3823

<http://www.geocities.com/water-alaska/>

Conducts training and provide technical assistance to small public water systems in Alaska, thereby enabling small rural communities and the State of Alaska to provide access for all residents to safe drinking water essential to public health.

### **Alaska Water and Waste Management Association (AWWMA)**

3201 C Street, Suite 406, Anchorage, Alaska 99502  
561-9777 Anchorage

<http://www.awwma.org/>

An organization of utility operators and managers that sponsors numerous training and information programs. AWWMA sponsors an annual conference, including a session on research and development for rural sanitation. They publish a newsletter, AWWMA News and Information, for members. Their web site includes lots of links.

## Information Sources

### **American Water Resources Association, Alaska Section**

PO Box 101184, Anchorage, Alaska 99510-1184  
258-4880 Anchorage

<http://www.awra.org/state/alaska/>

### **American Water Works Association (AWWA)**

Small Utility Network Hotline  
Toll Free 800-366-0107  
6666 West Quincy Avenue, Denver, CO 80235

<http://www.awwa.org/science/sun/>

The small utility network is a problem solving and information exchange service for systems serving fewer than 3,300 people. Provides newsletters and journals and a large bookstore of technical and nontechnical information.

### **National Drinking Water Clearinghouse**

Box 6064, West Virginia University  
Morgantown, WV 26506-6064  
Toll Free (800) 624-8301

[http://www.estd.wvu.edu/ndwc/ndwc\\_index.htm](http://www.estd.wvu.edu/ndwc/ndwc_index.htm)

Helps small communities by collecting, developing, and providing timely information relevant to drinking water issues.

### **National Small Flows Clearinghouse**

Box 6064, West Virginia University  
Morgantown, WV 26506-6064  
Toll Free (800) 624-8301

<http://www.nesc.wvu.edu/nsfc/>

Helps America's small communities solve their wastewater problems.

## **Appendix B**

### **National Rural Water Association, Alaska**

Toll Free (877) 694-6792.

<http://www.nrwa.org/alaskaruralwater/Default.htm>

To provide rural community water systems with the highest quality of support services designed to assist them in meeting the needs of their consumers.

### **Rural Alaska Sanitation Coalition (RASC)**

4201 Tudor Centre Drive, Suite 105

Anchorage, Alaska 99508

743-6111 Anchorage

<http://www.anhb.org/sub/rasc/index.html>

A statewide coalition committed to bringing about positive, long-term change in the substandard water, sewer, solid waste, and related environmental health conditions existing in Alaska villages.

### **Texas Water Resources Institute**

<http://twri.tamu.edu/>

Great pages of links, among the other information.

### **Water and Wastewater Equipment Manufacturers Association (WWEMA)**

<http://www.wwema.org/>

A non-profit trade organization founded in 1908 to represent the interests of companies that manufacture products sold to the potable water and wastewater treatment industries.

### **Water-Wastewater Web**

[www.w-ww.com/](http://www.w-ww.com/)

Vendors, links and a free web page for your utility.

## Appendix C

# Sample Siting Plan

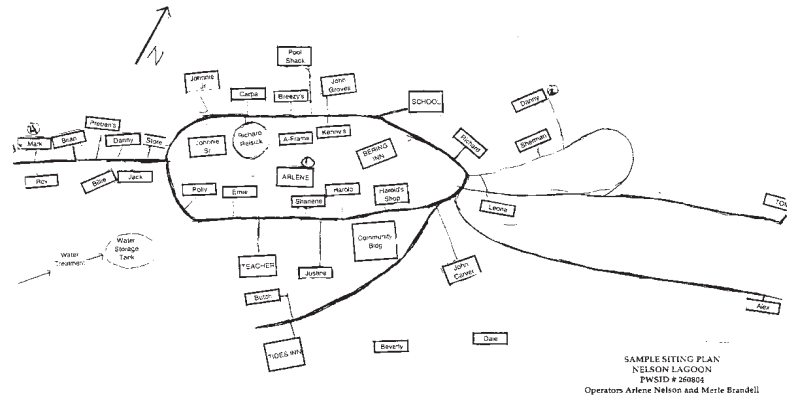
TOTAL COLIFORM (BACTI) SAMPLE SITING PLAN  
FOR THE COMMUNITY OF \_\_\_\_\_  
PWSID# \_\_\_\_\_

Preparing your total coliform sampling plan in advance will allow you to quickly collect samples for testing if a regular monthly sample should come back positive. This is important to ensuring public health, and preventing members of the community from getting sick when fecal contamination enters the water system.

Keep this Sample Siting Plan on file in the Water System Files. Mail a copy to ADEC.

Sketch the community, (or attach a map) showing:

- |   |   |  |
|---|---|--|
| <ul style="list-style-type: none"> <li>• Water Source</li> <li>• Water Storage Tank</li> <li>• Water Treatment Plant</li> <li>• Distribution Lines</li> <li>• Homes to be Sampled.</li> </ul> | <ul style="list-style-type: none"> <li>• First Service Connection</li> <li>• Pressure Reducing Stations</li> <li>• Booster Stations</li> <li>• Dead Ends</li> </ul> | <ul style="list-style-type: none"> <li>• Last Service Connection</li> <li>• Businesses, Schools, Churches</li> <li>• Areas, zones or actual sites for routine sampling.</li> </ul> |
|---|---|--|



1. \_\_\_\_\_ (One monthly sample taken here)

Within 24 hours of receiving a "Hot Bacti" notice from ADEC, take the following 4 additional samples:

2. \_\_\_\_\_ Five connections upstream of Sample Site 1.
3. \_\_\_\_\_ Five connections downstream of Sample Site 2.
4. \_\_\_\_\_ Sample near the end of distribution, or near the WTP.
5. \_\_\_\_\_ Repeat of Sample 1.

Contact Person for Water System \_\_\_\_\_ Phone \_\_\_\_\_  
 Address \_\_\_\_\_  
 Number of Samples required \_\_\_\_\_ per (month / quarter)  
 Number of Service Connections \_\_\_\_\_  
 Population Served Each Month \_\_\_\_\_  
 Reason for Choosing Sites selected: \_\_\_\_\_

## Notes

[illegible]

## Appendix D

# Certified Testing Labs in Alaska

### Microbiology Labs

907-592-4347	<b>Adak Drinking Water Laboratory</b> P.O. Box 1221 Adak, AK 99545
907-562-2343	<b>Chemical Testing and Engineering CT&amp;E, Environmental Services Inc.</b> 200 W. Potter Drive Anchorage, AK 99518-1605
907-349-1000	<b>Northern Testing Laboratories, Inc.</b> 5761 Silverado Way, Unit “N” Anchorage, AK 99518
907-852-0277	<b>North Slope Borough/DHSS Public Health Office</b> PO Box 925 Barrow, AK 99723
907-543-6420	<b>Yukon Kuskokwim Health Corporation Environmental Health &amp; Engineering Branch</b> PO Box 287-MSC-3021 Bethel, AK 99559
907-424-6338	<b>Cordova Wastewater Plant Laboratory</b> PO Box 1210 Cordova, AK 99574
907-659-2145	<b>Northern Testing Laboratories, Inc.</b> Pouch 340043 Deadhorse, AK 99734

## **Appendix D**

- 907-842-3396 **Bristol Bay Area Health Corporation**  
**Kanakananak Hospital**  
PO Box 130  
Dillingham, AK 99576
- 907-581-4904 **Surefish Laboratory**  
PO Box 447  
Dutch Harbor, AK 99692
- 907-456-3116 **Northern Testing Laboratories, Inc.**  
3330 Industrial Avenue  
Fairbanks, AK 99701
- 907-780-6668 **Analytica Alaska**  
5438 Shaune Drive  
Juneau, AK 99801
- 907-225-7917 **R&M Engineering**  
**Ketchikan Inc.**  
355 Carlanna Lake Road  
Ketchikan, AK 99901
- 907-486-8076 **City of Kodiak**  
**Wastewater Treatment Plant**  
2853 Spruce Cape Road  
Kodiak, AK 99615
- 907-442-7171 **Maniilaq Association**  
or PO Box 43  
800-478-3321 ext. 5th & Grizzly Way  
7171 Kotzebue, AK 99752
- 907-246-3664 **King Salmon Wastewater Facility**  
PO Box 189  
Naknek, AK 99633
- 907-443-3216 **Norton Sound Health Corporation**  
PO Box 966  
Nome, AK 99762



### **Certified Testing Labs in Alaska**

- 907-745-3005 **Mat-Su Test Lab of Alaska**  
PO Box 2749  
Palmer, AK 99645
- 907-772-4291 **Petersburg General Hospital  
Microbiology Laboratory**  
PO Box 589  
Petersburg, AK 99833
- 907-966-2256 **City & Borough of Sitka  
Water/Wastewater Laboratory**  
416 Galena Dr.  
Sitka, AK 99835
- 907-260-5311 **Central Alaska Engineering**  
32266 E. Lakefront  
Soldotna, AK 99669
- 907-262-4624 **Northern Test Lab**  
35186 Kenai Spur Hwy.  
Soldotna, AK 99669
- 907-835-4888 **City of Valdez  
Valdez Wastewater Treatment  
Plant Laboratory**  
PO Box 307  
Valdez, AK 99686
- 907-247-2368 **B&D Water Laboratory**  
PO Box 611  
Ward Cove, AK 99928
- 907-376-6989 **Erdman & Associates  
Engineering/Water Testing**  
5200 Dunbar Drive  
Wasilla, AK 99654
- 907-874-7126 **Wrangell General Hospital**  
PO Box 1081  
Wrangell, AK 99929

See a list of full  
service labs on  
the next page.

## Appendix D

Certified  
drinking  
water labs  
in Alaska

Certified Drinking Water Labs in Alaska					
	Analytica Alaska – Southeast 5438 Shaune Drive Juneau, AK 99801 907-780-6668	CT&E Environmental Services, Inc. 200 W Potter Drive Anchorage, AK 99518 907-562-2343	Mat-Su Test Lab of Alaska P.O. Box 2749 Palmer, AK 99645 907-745-3005	Northern Testing Laboratories – Anchorage 5761 Silverado Way, Unit N Anchorage, AK 99518 907-349-1000	Northern Testing Laboratories – Fairbanks 3330 Industrial Ave. Fairbanks, AK 99701 907-456-3116
<b>Certified for:</b>					
Coliform	✓	✓	✓	✓	✓
Turbidity				✓	✓
Fluoride		✓		✓	✓
Nitrate	✓	✓	✓	✓	✓
Nitrite	✓	✓		✓	✓
Old IOCs	No labs in Alaska are certified, contact ADEC for details				
New IOCs					
VOCs		✓		✓	
SOCs pesticides & PCBs	No labs in Alaska are certified, contact ADEC for details				
SOCs other					
Radioactivity					
Lead/Copper		✓			✓
Asbestos	No labs in Alaska are certified, contact ADEC for details				

## Appendix E

# Regulations Used in Guide

When this guide was published in July 2002, the following regulations were in effect:

### **Alaska Administrative Code (AAC)**

- 18 AAC 80 Drinking Water September 28, 2001.
- 18 AAC 70 Water Quality Standards May 27, 1999
- 18 AAC 72 Wastewater Disposal January 17, 2002
- 18 AAC 74 Operator Certification and Training  
January 18, 2001
- 18 AAC 50 Air Quality Control Regulations  
June 1, 2002
- 18 AAC 60 Solid Waste Management June 30, 2002

If you have internet access, check the regulations at:  
<http://www.state.ak.us/local/googlesearch.html>

Check on proposed changes, if any, at:  
[http://www.state.ak.us/dec/dec\\_cal.htm#Regulation](http://www.state.ak.us/dec/dec_cal.htm#Regulation)

### **Regulation Code of Federal Regulations (CFR)**

- 40 CFR 141 & 143 Drinking Water Requirements
- 40 CFR 122 Wastewater Discharges

The Code of Federal Regulations is republished each July 1, sometimes with little or no change to a given section. The Federal Register is published daily and lists changes as they are made.

If you have internet access, check the regulations at:  
<http://www.epa.gov/OGWDW/regs.html> or  
[www.access.gpo.gov/nara/cfr/cfr-retrieve.html](http://www.access.gpo.gov/nara/cfr/cfr-retrieve.html)

You can access the Federal Register at:  
[http://www.access.gpo.gov/su\\_docs/aces/aces140.html](http://www.access.gpo.gov/su_docs/aces/aces140.html)

*This guide is updated from time to time. Always make sure you are not referring to an outdated version.*

## Notes

[illegible]

**Key:** ADEC = Alaska Department of Environmental Conservation  
 CEU = continuing education units (1 unit=10 classroom hours)  
 HAA5 = haloacetic acids  
 IOC = inorganic chemical  
 SOC = synthetic organic chemicals  
 TTHMs = total trihalomethanes  
 TOC = total organic carbon  
 VOC = volatile organic compounds

## Appendix F

## Compliance Calendars

## Class A — Groundwater

Frequency	Requirement	Notes
Three times per day	Residual chlorine (if serving 1,001-2,500 people per day)	
Twice daily	Residual chlorine (if serving 501-1,000 people per day)	If disinfectant (chlorine) is used
Daily	Test fluoride, if applicable	If fluoride is used
	Test disinfectants (chlorine dioxide) <sup>a</sup>	If disinfectant (chlorine) is used
	Disinfectant by-products (chlorite) <sup>a</sup>	If disinfectant (chlorine) is used
	Disinfectant by-products (chlorite) <sup>a</sup>	If disinfectant (chlorine) is used
	Residual chlorine (if serving 500 or less per day)	
Twice a month	Test total coliform (if serving 1,001-2,500 people per day)	Samples must be collected on different days
Monthly	Test disinfectants (chlorine, chloramines), if applicable <sup>a</sup>	If disinfectant (chlorine) is used
	Test disinfectant by-products (bromate), if applicable <sup>a</sup>	Ozone systems only
	Test disinfectant by-products (TOC), if applicable <sup>a</sup>	If chlorine is used
	Test total coliform (if 25-1,000 people served per day)	
	Report daily operator readings & monthly coliform test results to ADEC (if applicable)	Use ADEC monthly report form
	Check critical parts inventory. Reorder if necessary.	Not a regulation
Quarterly	Test disinfectant by-products (TTHMs, HAA5), if applicable <sup>a</sup>	If disinfectant (chlorine) is used
Annually	Test nitrate	Quarter with highest concentration
	Test lead/copper tap samples	Initial sampling is extensive and depends on population
Every 3 years	Take continuing education classes (operator)	3 CEU (approved courses and pay fee)
	Arsenic monitoring requirement (after Jan. 23, 2006)	Based on new MCL of 10 ug/L
Every 4 years	Test radioactivity (CWS only)	Check for waivers
Every 5 years	Complete a sanitary survey	Must be done by a third party
Initially	Test nitrite	Test again at ADEC discretion
Once every	Test SOC	Initial quarterly sampling, check for waivers
Compliance period	Test asbestos	Check for waivers
	Test VOCs	After initial monitoring requirements are met.
	Test IOCs	After initial monitoring requirements are met.
	Arsenic monitoring requirement (prior to Jan. 23, 2006)	Based on current MCL of 50 ug/L
	Reapply for monitoring waivers, sample again if required	May have to sample to maintain certain waivers

<sup>a</sup>Based on the Disinfectants and Disinfection By-Products (D/DBP) Rule, effective January 2003

This chart is generalized — Call ADEC for a copy of your specific water system *monitoring summary*.

## Compliance Calendars

### Class B — Groundwater

Frequency	Requirement	Notes
Daily	Test fluoride, if applicable	If fluoride is used
	Test residual chlorine (if serving 1,001-2,500 people per day)	If chlorine is added
Twice a month	Total coliform (if serve 1,001-2,500 people)	
Monthly	Check critical parts inventory. Reorder if necessary.	Not a regulation
Quarterly	Test total coliform (if serve 1,000 or fewer people per day)	
Annually	Test nitrate	
Initially	Test nitrite	
Every 5 years	Complete a sanitary survey.	Must be done by third party
Once every compliance period	Reapply for waivers	

This chart is generalized — Call ADEC for a copy of your specific water system *monitoring summary*.

**Key:** ADEC = Alaska Department of Environmental Conservation  
CEU = continuing education units (1 unit = 10 classroom hours)

## Compliance Calendars

### Class A — Surface Water (or GWUDISW)

Frequency	Requirement	Notes
Three times per day	Test residual chlorine (if serving 1,001-2,500 people per day)	If chlorine is used
Twice daily	Test total coliform (if serving 501-3,300 people per day and system is avoiding filtration)	
	Test residual chlorine (if serving 501-1,000 people per day)	
Daily	Test fluoride	If fluoride is used
	Test turbidity (filtered systems)	Contact ADEC for unfiltered systems
	Test total coliform (if serving 500 or fewer people per day and system is avoiding filtration)	
	Test residual chlorine (if serving 500 or less per day)	If chlorine is used
	Test disinfectants (chlorine dioxide)	If disinfectant (chlorine) is used
	Test disinfectant by-products (chlorite)	If disinfectant (chlorine) is used
Twice a month	Test total coliform (if 1,001-2,500 people served per day)	Samples must be collected on different days
Monthly	Test total coliform (if 25-1,000 people served per day)	
	Test disinfectants (chlorine, chloramines), if applicable <sup>a</sup>	If disinfectant (chlorine) is used
	Test disinfectant by-products (bromate), if applicable <sup>a</sup>	Ozone systems only
	Test disinfectant by-products (TOC, alkalinity), if applicable <sup>a</sup>	If chlorine is used
	Report daily operator readings & monthly coliform test results to ADEC (if applicable)	Use ADEC monthly report form
	Check critical parts inventory. Reorder if necessary.	Not a regulation
Quarterly	Test nitrate	May be reduced to annually
	Test disinfectant by-products (TTHMs, HAA5), if applicable <sup>a</sup>	If disinfectant (chlorine) is used
Annually	Test VOCs	
	Test IOCs	Check for waivers
	Arsenic monitoring requirement (after Jan. 23, 2006)	Based on new MCL of 10 ug/L
Every 3 years	Complete a sanitary survey	Must be done by third party.
	Take continuing education classes (operator)	3 CEU (approved courses) and pay fee
Every 4 years	Test radioactivity (CWS only)	Check for waivers
Initially	Test nitrite	Test again at ADEC discretion
Once every	Test SOCs	Initial quarterly sampling, check for waivers
Compliance period	Test asbestos	Check for waivers
	Arsenic monitoring requirement (prior to Jan. 23, 2006)	Based on current MCL of 50 ug/L
	Reapply for monitoring waivers, sample again if required	May have to maintain certain waivers.

<sup>a</sup> Based on the Disinfectants and Disinfection By-Products (D/DBP) Rule, effective January 2003

This chart is generalized — Call ADEC for a copy of your specific water system *monitoring summary*.

**Key:** ADEC = Alaska Department of Environmental Conservation  
 CEU = continuing education units (1 unit = 10 classroom hours)  
 HAA5 = haloacetic acids  
 IOC = inorganic chemical  
 SOC = synthetic organic chemicals  
 TTHMs = total trihalomethanes  
 TOC = total organic carbon  
 VOC = volatile organic compounds

## Compliance Calendars

### Class B — Surface Water (or GWUDISW)

Frequency	Requirement	Notes
Three times per day	Test residual chlorine (if serving 1,001-2,500 people per day)	If chlorine is added
Twice daily	Test total coliform (if serving 501-3,300 people and system is avoiding filtration)	
	Test residual chlorine (if serving 500 people or less per day)	If chlorine is used
Daily	Test fluoride, if applicable	If fluoride is used
	Test turbidity (for filtered systems)	Contact ADEC for unfiltered systems
	Test total coliform (if serving 500 or fewer people per day and if avoiding filtration)	
	Test residual chlorine (if serving 1,001-2,500 people per day)	If chlorine is added
Twice a month	Test total coliform (if 1,001-2,500 people served per day)	Samples must be collected on different days
Monthly	Test total coliform (if 25-1,000 people served per day)	
	Report daily operator readings & monthly coliform test results to ADEC (if applicable)	Use ADEC monthly report form
	Check critical parts inventory. Reorder if necessary.	Not a regulation
Annually	Test nitrate	
Every 3 years	Take continuing education classes (operator)	3 CEU (approved courses) and pay fee
	Complete a sanitary survey	Must be done by third party.
Initially	Test nitrite	

This chart is generalized — Call ADEC for a copy of your specific water system *monitoring summary*.

**Key:** ADEC = Alaska Department of Environmental Conservation  
 CEU = continuing education units (1 unit=10 classroom hours)  
 GWUDISW = groundwater under the direct influence of surface water



# Index

**Bold** references indicate tables, charts, and forms

- action levels 96
- Alaska Administrative Code 169
- Alaska Native Tribal Health Consortium Department 160
- Alaska Training and Technical Assistance Center 160
- approval to operate 36
- arsenic 99
- asbestos 108, **109**
- backflow 35
- bacteria 60, 80
- beaver fever (Giardiasis) 12
- blue baby syndrome 12, 92
- Boil Water notice 90, **123**
- cancer 12, 101
- capacity 25–29
  - financial 26, 27
  - improving 28
  - managerial 26, 27
  - self-assessments 26
  - technical 25, 26
- certificate to construct 36
- certificate to operate 37
- certification and training 39–42, **43**
- certified laboratories 65, 165
- chain of custody 69, **70**
- chlorine 59
- Code of Federal Regulations 169
- coliform bacteria 60
- compliance calendars **171–174**
- compliance testing 65–77
- compliance tests 51, **73**
- composite sampling **76**
- construction 31–37
- consumer confidence report 115–119
  - distribution 115
  - helpful hints 119
  - requirements 116
- copper 94, **95, 96**
- cross connections 35
- Cryptosporidium 12, 118
- direct responsible charge 41
- discharging lagoons 137
- diseases. *See* health effects
- Disinfectants and Disinfection By-Products Rule 83, **84, 85**
- disinfection 80
- E. coli* 11, 60
- Environmental Protection Agency (EPA) 159
- exemptions 75
- fecal coliform 60
- first-draw samples 95
- fluoride 61, 90, **91**
- full service labs **168**
- Giardiasis 12

## Index

- government contacts
  - 15, 155, **156**
- grandfathering 75
- GWUDISW 48
- health effects 11
  - cancer 12, 101
  - cryptosporidiasis 12, 118
  - diarrhea 11
  - giardiasis 12
  - hepatitis 11
  - lead poisoning 12, 94
  - methemoglobinemia 12, 92
- hepatitis. *See* health effects: hepatitis
- honey bucket 138
- information sources 157–162
- inorganic chemicals (IOCs) **97, 98**
- Internet resources 157–162, 169
- labeling samples 67
- laboratories 65, 165
- lagoons, sewage 136–139
- lead 12, 94, **95, 96**
- lead poisoning 12, 94
- logsheet, monthly report 56, **57**
- maximum contaminant levels 71
- methemoglobinemia 12, 92
- microbiology laboratories 165
- monthly report logsheet 56, **57**
- nitrate and nitrite **92, 93**
- operations testing 51, 55–61
- operator certification and training 39, 39–42
- operator-in-training 40
- PCBs 105
- percolating lagoons 137
- permits, wastewater 132
- plan approvals 32, 131
- plumbing survey 96
- preapplication conference 32, 130
- protection, wellhead and watershed 50
- protozoa 12, 80
- public notice 121–125
- qualified operator 39
- radioactive materials 110, **111**
- recreation 140
- regulations 15–21
  - construction 31–37
  - list with dates 169
  - violations 16
  - water quality 139
- Remote Maintenance Workers (RMWs) **155, 156**
- reporting test results 52, 56, **57**
- residual chlorine 59, 60, 80
- road map **22**
- Rural Utility Business Advisors **155, 159**
- sample siting plan 86, **163**
- sampling. *See* testing
- sanitary survey 50
- separation distances **33, 139**

## Index

- septic systems 135
  - chemical additives 136
  - duplex 9, 130
  - separation distances **139**
  - single family home 9, 130
- sewage. *See* wastewater
- sewage lagoons 136–139
- sewage solids 137
- shipping samples 69
- source water assessments 50
- State of Alaska contacts **155**
- Surface Water Treatment Rule 79
- susceptibility assessments 50
- synthetic organic chemicals (SOCs) 105, **106**, **107**
- testing
  - arsenic 99
  - asbestos 108, **109**
  - chain of custody 69, **70**
  - compliance 51, 65–77, **73**
  - composite sampling **76**
  - Disinfectants and Disinfection By-Products Rule 83, **84**, **85**
  - exemptions 75
  - fluoride 90, **91**
  - grandfathering 75
  - important tips 66
  - inorganic chemicals (IOCs) **97**, **98**
  - labeling samples 67
  - lead and copper 94, **95**, **96**
  - locations **68**
  - nitrate and nitrite **92**, **93**
  - operations 51, 55–61, 60
  - out of limits flow chart **74**
  - overview table **76**
  - radioactive materials 110, **111**
  - reporting results 52
  - residual chlorine 59, 60
  - road map **22**
  - sample siting plan 86, **163**
  - shipping samples 69
  - Surface Water Treatment Rule 79
  - synthetic organic chemicals (SOCs) 105, **106**, **107**
  - total coliform 60, **87**, **89**
  - Total Coliform Rule 85
  - turbidity **58**
  - variances 75
  - volatile organic chemicals (VOCs) 101, **102**, **104**
  - waivers 72
  - total coliform **87**
  - Total Coliform Rule 85
  - training 39–42, 65–77, 157
  - turbidity **58**
- U.S. government 159
- uranium **111**
- variances 75
- Village Safe Water Program 158
- violations 16

## Index

viruses 80  
volatile organic chemicals  
  (VOCs) 101, **102**, **104**  
  
waivers 72  
wastewater 129–140  
  certified operators 131  
  honey buckets 129  
  lagoons 136–139  
  permits 132  
  plan approvals  
    131, **133**  
  preapplication  
    conference 130  
  separation distances  
    **139**  
water quality standards 139  
water sources 47, 79  
wells, private 9

*The following information is provided in  
accordance with state law AS 44.99.210:*

**Name of agency releasing publication:**

Department of Community and Economic Development

**Production cost for each copy of the publication:**

\$6.50

**Purpose of the publication:**

To help operators and managers of small rural Alaska  
water and wastewater utilities to understand and  
comply with state and federal regulations.

**City and state where printed:**

Anchorage, Alaska